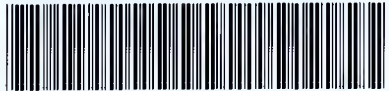


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A JOURNAL
OF MANUFACTURING
INDUSTRY

THE *Inventive Age*
AND SCIENTIFIC PROGRESS.

NINETEENTH YEAR.
No. 1.

WASHINGTON, D. C.—JANUARY, 1907.

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ELECTRICITY ON WARSHIPS.

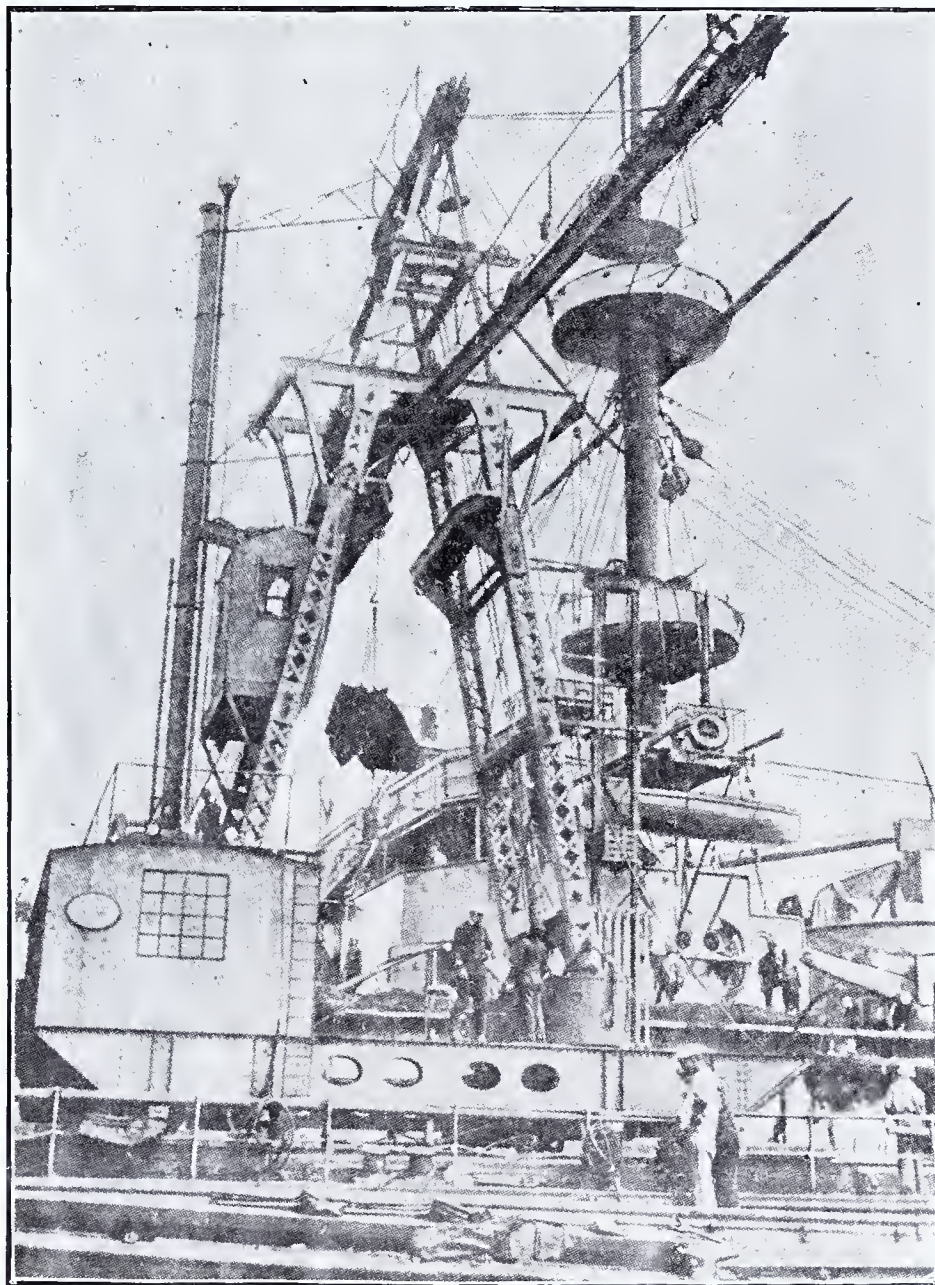
THE modern man-of-war represents a thorough and up-to-date equipment covering the whole field of electrical ingenuity. An abundant power plant supplies current for lighting the entire ship, for the searchlights, for an elaborate system of night signals, for the wireless telegraph, etc. The ship also has its engine room telegraph from bridge and pilot house, where the simple movement of a lever gives minute directions for the handling of the vessel. The use of electricity in providing all the necessities of the ship has developed to an astonishing degree. Thirty miles of copper wire are required to convey the current from dynamos to motors and the working devices, in the most modern vessels. Electricity now hoists the great shells from ammunition rooms to gun turrets at the rate of 200 feet a minute. The same power moves the tremendous guns into place, and an electric button discharges the deadly broadside.

Electricity competes with steam and fire in the hold of the ship, serving as motive power for ventilating fans in great number. When it is realized that the temperature below deck often rises to 300 degrees F., it may be seen how important are the fans to the health of the men. Electricity likewise operates the ship's laundry machinery; it turns the deck winches; it illuminates the vessel throughout; it facilitates the coaling; to a limited but steadily growing extent, it is supplanting other sources of heat for cooking on shipboard. The accompanying illustration shows a modern battleship being coaled by electric power.

The steering gear was one of the few important parts of the ship's equipment that, until recently, had not surrendered to the twentieth century system. With its steering apparatus crippled, the ship has heretofore been at the mercy of the elements. The portable steering apparatus, however, is now being introduced. This apparatus, it is asserted, will make it possible to direct the ship from any one of a half dozen stations by means of electrical connections

there located, and all communicating with the steering room, the most carefully protected part of a warship.

No better example of the increasing importance of electrical appliances in modern warfare was afforded than the extensive use made of the wireless telegraph and telephone in the operations of the armies and navies of Japan and Russia. The ships of each fleet were kept in regular communication by the wireless apparatus.



COALING BY ELECTRICITY.

The telautograph, or writing telegraph, is a newer factor in communicating messages and orders. By means of an electrically operated pen at one end of the line, it transmits the exact facsimile of handwriting made at the other end. This device, which is becoming popular in banks, railroad offices, etc., also finds its uses in the navy.

But no improvement of recent date is of equal importance to that which

consists of insuring the safety of the ship in case of collision, grounding, explosion or other disaster resulting in puncture of the hull. When the British vessel *Camperdown* plunged into the *Victoria* ten years ago, during some peaceful maneuvers, the latter went down and carried 500 men with her. How to prevent such disasters has always been a problem for the admiralty departments of different countries. That naval architects had not solved it was made clear in the last war, for whenever either a Russian or a Japanese vessel was struck below the water line, to the bottom it went. Some of the boats recently launched for Uncle Sam, however, come near to being unsinkable.

The solution of the problem lies in a system of automatic bulkhead doors, operated by electricity, and permitting of closure in time of emergency by a single officer on the bridge of the ship. This officer has before him two dials, with a hole in the center of each and borders of small disc around the edges. These are the central emergency stations, each controlling a certain number of bulkhead doors and hatch gears below the protected deck. Each of the discs is numbered to correspond to a door in some vital part of the ship. This, of course, is the controller of the system. On all the main bulkhead openings are electric motors connected with the station by conductor wires. Suppose that the vessel is rammed by an enemy; the man nearest the emergency station pulls a latch similar to a fire alarm box. Instantly the doors are set in motion, and within less than two minutes every one is brought into its water-tight groove. The boat, it should be understood, is divided into water-tight compartments, with bulkhead doors between. When the doors are shut, in case of a puncture, only the compartment nearest the rent will be flooded. This system has long been used on ships, and was installed on the unfortunate *Victoria*; but her men were too excited to close the doors. With an automatic device, the vessel is practically unsinkable.

If there is any trouble at any door,

it will show in the corresponding disc of the station. If a seaman has been imprisoned in a compartment, he has only to raise a lever, the door will move back, allow him to pass through, and close again automatically. This device, which has been named the "long-arm" system, because of the long arm of electric wires that reaches out to save the ship, assures the preservation of the crew, and leaves nothing to individual initiative. A man presses a button and machinery does the rest.

Patent Rights in Cuba.

DECISION BY THE SUPREME COURT OF THE ISLAND.

The supreme court of the island of Cuba has just rendered a decision of the greatest importance to importers of every kind of patented goods. The decision will mean the preventing in the future of many frauds which have discouraged those interests in this branch of commerce in Cuba.

For years importers of patented articles have been prevented from importing certain classes of machinery and many useful things because some one on the island had stolen the patent. The way the fraud was committed was by obtaining the patented article from the United States or other countries, and delivering it to the Bureau of Patents here as their own.

In this way they effectually controlled the sale of the article in this market, while the real patentees were powerless to help themselves.

The company succeeding in beating this fraud is Gomez & Co., of Santa Clara street, manufacturers and importers of hat bands. Some months ago this company imported a patented hat band, and were doing a large business with it, when a man by the name of Jose Vidal y Alvarez obtained in Cuba a patent for the same thing. Then the house of Gomez was compelled to either forego the use of the patent or buy only from Vidal.

The Gomez house took the case to court, and after the usual long wait the trial was held and the decision rendered in favor of the plaintiff. Vidal, however, appealed the case, and it went to a higher court. In the latter Vidal won. Gomez & Co. succeeded finally in appealing the case to the supreme court, where it has been for months.

The case was called for trial four days ago and the decision was rendered yesterday in favor of the plaintiff, thus settling once and for all a contention that has given honest importers in Cuba a black name with manufacturing interests in several foreign countries.

It is not known as yet whether the decision of the supreme court will have any effect on another similar evil or not. The other evil, or, rather, fraud, is the stealing, not of patents, but of trade-marks. Some men in Cuba, upon seeing a shoe or a soap or some drink that happened to be well advertised in the United States or elsewhere, have registered the trade-mark here. The result has been that when the real manufacturer arrived on the scene, he found that he would either have to change the name of his product, or pay a species of blackmail before he could sell his goods.

As the fraud is so similar to the one of the patents, some of the best legal authorities in Havana declare that the first case of the kind carried to the supreme court will be settled in the same way.

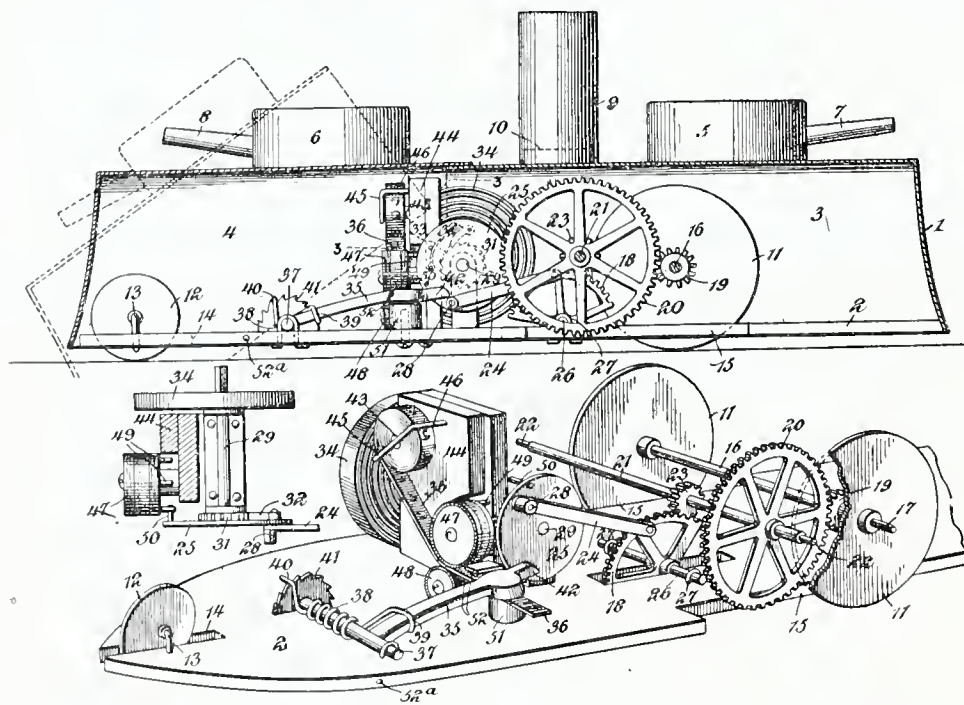
TOY BATTLE SHIP.

There lives in Nashville, Tennessee, a man whom the children of the United States should regard as a universal benefactor. He might even lay claim to the unique appellation of the American Santa Claus, on account of the remarkable fertility of his genius in designing novel pieces of mechanism to gladden the hearts of young America. More and more insistent, every year, has come the demand for "live" toys. The child of the twentieth century is not satisfied with inanimate bits of wood and iron. His toys must run, and run of themselves. The great movement towards the use of automatic machinery in our workshops and factories—so characteristic a feature of this age of energy—has found an echo in the toy industry. A generation ago, a doll that could open and shut its eyes was considered the *ne plus ultra* of mechanical achievement in this particular line. Now it must talk and walk, dance and perform acrobatic feats. A wagon or a train of cars that must be dragged about by a string awakens no enthusiasm in the boyish breast. Nowadays, a locomotive must run with its own power, with real steam in the boiler;

the world is trying to surpass the others in building navies, it is only proper that the children, too, should have their war vessels. And this is what Mr. Wood has provided—a boat that not only moves, but simulates all the actions of the huge engines of destruction that are now being launched.

It will be seen by the illustration that the vessel—a technical description of the working of which is given below—is a Dreadnaught in miniature, a tiny ironclad, equipped with heavy guns. When the enemy is sighted, the boat advances, discharges its battery, and at once retires, so as to get out of range of its opponent's guns. The mechanism, though ingenious, is extremely simple, and in all respects works like an actual battleship during an engagement.

In the accompanying illustration, the body 1 is in the form of the upper portion of a battleship, but the toy may assume the shape of any other fighting machine. It consists of a bottom or platform on which a spring motor is mounted, and a pivoted casing, which is adapted to be opened to expose the mechanism concealed within it. The rear portion of the body is supported by traction wheels 11, and the front portion is provided with a



an automobile must have the appearance, at least, of having an electric battery concealed in its tonneau.

The toy manufacturers are often put to it, as the holiday season approaches, to supply mechanical devices that have the element of novelty. The American Santa Claus—W. T. Wood—has done much to solve the problem and to satisfy the craving for some new thing. He has invented a number of toys which, while surprisingly simple in construction—which means that there is no complicated machinery to get out of order before Christmas week is over—have the merit of being unusual in design. There is a frog, for instance, from whose throat issues a musical note as he jumps. A group of a cat catching a mouse is also delightfully natural. But his latest invention surpasses all previous ones, and bids fair to be as popular, next Christmas, as was the Teddy bear last season. In this day when the air is full of the talk of battleships and armored cruisers and torpedo boats, when every nation of

loosely mounted pilot wheel 12.

Motion is communicated to the traction wheels through a crank wheel 25, a connecting rod 24 and an oscillatory segment 18, which first rotates the traction wheels in one direction and then in the opposite direction, causing the toy to run back and forth, while the loosely mounted pilot wheel wobbles and causes the toy to change its course and maneuver. When the oscillatory segment reaches the limit of its movement in one direction, the toy will stop and the propelling mechanism will remain inactive, while the connecting rod is passing around the dead center. The power of the motor, which would otherwise remain unemployed except to carry the connecting rod around the dead center, is utilized to operate firing mechanism for discharging a paper cap. The firing mechanism embodies a spring-actuated hammer 35, and a strip 36 of paper caps or fulminate ribbon, which is arranged in the form of a roll. The hammer 35 is located in advance of the crank wheel, and its engaging

end is arranged in the path of the wrist pin 28, to which the rod 24 is connected, so that the hammer will be raised and automatically tripped, during each revolution of the wrist pin, and at the end of the forward movement of the toy. The fulminate strip or ribbon is fed beneath the hammer by means of a wheel, which is positively operated by a crank wheel 25. It will thus be seen that the toy runs back and forth, constantly changing its direction, and that a paper cap is discharged at the end of each advance movement, while the toy is stationary.

Mr. E. W. Morgan of Nashville is the owner of a part interest in the invention, which has been patented in several foreign countries. The toy will be made in Germany, where all good toys originate.

The Coming Revolution in Electric Lighting.

Ever since Edison, after searching all over the world, decided that a loop of carbon was the best thing to turn an electric current into light, inventors have been striving to find something better still. The carbon loop has served a good purpose, but now, apparently, it must soon go into the junk heap along with other things discarded on the march of science. It was efficient enough to introduce the age of the electric light, but not to carry the development to its highest point. For some time predictions have been heard from scientific quarters that a revolution in electric lighting is at hand. A few weeks ago a high authority asserted that within a year an electric glow lamp, having a filament composed of the metal tungsten, would be on the market, and that the output of light per unit of power would be increased at least threefold; in other words, that the light-producing capacity of every electric light station in the world would be at once multiplied by three.

This pleasing prediction is now itself multiplied by thirteen, for from Columbia College comes the news that Messrs. H. C. Parker and W. G. Clark have found a still better substance than tungsten as a substitute for the carbon filament. They call it helion, because its light resembles that of the remarkable element helium, one of the constituents of the glowing atmosphere of the sun. With filaments of helion, it is averred, an electric lamp will give out forty-five times as much light as can be obtained from the old carbon loops. Moreover, the new filaments are more lasting than carbon, their "life" being about twice as long. Some other new forms of filament, not equally effective as light givers, however, are still longer lived. Another bit of good news in regard to these new forms of electric lamps is that they will greatly reduce the cost of light to consumers. This statement, being based upon a scientific authority, is a good thing to remember, so that when the predicted revolution comes, and the world begins to glow at night with hitherto unheard of brilliancy, some enterprising manipulator of "business capital" shall not be permitted to fool the public with stories about extraordinary expenses and a famine in filaments.

WORLD'S FAIR IN 1909.

Alaska-Yukon-Pacific Exposition at Seattle will Exploit Northland and Oriental Trade—
To Cost \$10,000,000—Queen City Raises \$650,000 for enterprise in one day.

At the present time much interest is centered in Seattle in the work of creating the Alaska-Yukon-Pacific Exposition, which will be held in 1909, opening June 1 and closing October 15.

Although three years remain before the fair will be opened to the public, the management is hard at work perfecting and carrying out plans to make the enterprises worthy of the purposes it will aim to accomplish.

Beginning with the idea of making the new western world's fair original in every possible way, the management has succeeded admirably up to the present time, and if the financing of it, which broke all exposition records, can be taken as a criterion of the manner in which the plans already outlined will be carried out, there is no room for doubt as to the originality that will characterize the 1909 fair.

On October 2, last, five months after the incorporation of the exposition company, which was effected May 7, the people of Seattle were called upon to finance the enterprise by subscribing in one day to its capital stock of \$500,000. In a generous and public spirited manner they over-subscribed to the extent of \$150,000, making the total amount available with which to begin work \$650,000. No other city for any purpose ever equalled such a feat. "Seattle spirit," for which the people of the Queen City are noted, was responsible for this remarkable achievement. More than half a million dollars in one day is a large amount of money to be raised in a city of 200,000 inhabitants. The slogan adopted by Will H. Parry, chairman of the ways and means committee was, "Everybody Helps" and everybody did help with the result that an average of more than \$3. was subscribed for every man, woman and child in the city.

As soon as the capital stock had been subscribed, John C. Olmsted, the noted landscape artist of Brookline, Massachusetts, who laid out the Chicago and Portland expositions, was called to Seattle and he is now busily engaged in designing the grounds and arranging the buildings. He has pronounced the site as, scenically, the finest ever utilized for such a purpose.

Henry E. Reed, director of exploitation, is now busily engaged in making arrangements for the states to participate. He has Major T. S. Clarkson, special commissioner, in the field visiting the governors of all the commonwealths. So far Major Clarkson has met with unprecedented success. Every governor he has talked with has signified his intention of recommending a liberal appropriation for a building and an exhibit. Mr. Reed is also carrying on an extensive campaign to secure the 1909 meetings of national conventions.

The executive committee of the exposition has appropriated \$100,000 for the live stock show, which will be on an extensive scale, and from present indications promises to be the most successful ever held.

The management is receiving letters from all over the country endorsing the object of the exposition, and pledging support from different localities.

The primary purpose of the fair is to exploit the resources and potentialities of Alaska-Yukon and the Pacific Northwest, and to make known and foster the vast importance of the trade of the Pacific Ocean and of the countries bordering upon it. Differing

from other fairs, the Alaska-Yukon-Pacific Exposition will not celebrate any particular event. The awakening of the Pacific, the wonderful achievement in all lines of effort of the countries in and bordering thereon, and the important role the commerce of the great ocean plays in that of the world, are the most noteworthy things the fair will celebrate. It will be a great international exposition. Historical sentiment will not be depended upon to arouse interest and induce participation.

In the first place the fair will show the world, through its exhibits, that Alaska can produce other things besides snow and gold; it will give the general public a better conception of the resources, advantages and possibilities of the territory, and of its geographical and climatic conditions. The same is also true of Yukon.

The Fair will increase the commerce of the Pacific by teaching the merchants and manufacturers of the Orient and Occident the needs of the people of their respective markets, and how to secure and hold the business. Oriental buyer and Occidental seller, as well as Occidental buyer and Oriental seller, will be brought closer together to their mutual advantage, through exhibits collected with that aim in view.

The exploitation of the Pacific Northwest—in fact the entire western country—will be, naturally, another important result that will be accomplished by the Alaska-Yukon-Pacific Exposition. The Lewis and Clark fair and its attendant publicity placed this section prominently on the map. The interest that exposition created beyond the Rocky mountains in this section will be stimulated and increased during the next three years. With the foundation in exploitation laid by Portland to build upon, the attendance at the 1909 fair and the subsequent benefits will be on a large scale.

It is estimated that the Fair will cost \$10,000,000. The amount the exposition company will spend and the United States Government and State of Washington appropriations will make a fourth of this amount, and the sums the states, foreign nations, exhibitors and concessionaires will expend will aggregate the remaining three-fourths.

The exposition site comprises 255 acres of the campus of the Washington University. In its virgin state it presents everything to please the eye. There are tall, stately giants of the forest forming beautiful vistas, gentle slopes, commanding terraces and unsurpassed stretches of water front.

The grounds border for more than a mile and a half on Lake Union and Lake Washington. The Olympic and Cascade mountains are in plain sight, and an unobstructed view of the perpetual snow peaks of Mt. Rainier and Mt. Baker may be obtained. In constructing the buildings and laying out the grounds, every care will be taken to preserve nature's own handiwork.

Differing from former fairs, the Alaska-Yukon-Pacific Exposition includes in its plan the erection of permanent buildings. Many of the large exhibit palaces will be substantially erected and they will remain as the property of the University after the fair closes, to be used for educational purposes. Thus the Washington state appropriation will be used for a permanent good aside from the benefits that will accrue to the commonwealth from the fair. The states and nations will be invited to erect buildings of a permanent character, which will give them an opportunity to install lasting memorials of their progressiveness.

The Coal Tar Jubilee.

At the recent jubilee of the coal tar color industry, held in New York city, many interesting facts in regard to the progress of investigation in this line were brought out. Dr. Hugo Schweitzer, one of the most eminent chemists engaged in this industry, spoke on the development of the work, and called attention to the fact that it was only fifty years ago, while trying to produce quinine artificially, that Sir William Perkin inaugurated the discoveries that have led to such successful enterprises. At this point, it may be noted that although many master minds have been occupied with the same problem, the artificial production of quinine still remains unsolved, although research for it has resulted in most unexpected results in other fields. Instead of quinine, a dirty reddish brown precipitate was formed, which turned out to be the first of the aniline dyes—an epoch-making discovery, which soon showed its vitalizing power in almost every branch of human endeavor. Today two thousand individual dyestuffs are known, giving the whole range of the colors of the rainbow, and complying with every demand of taste, fashion and stability. Contrary to the prevailing impression, the shades obtained with some of them are faster than those produced by nature. The greatest triumph of this branch of the industry was the artificial production of alizarine and indigo. These are now manufactured so cheaply that the cultivation of the madder root and of the indigo plant has almost ceased. Coal tar colors are used not only for dyeing textile fibers, but for many other materials. A lady's hair is grey—coal tar will restore youth to her. The German rejoices in his frankfurter—the sanguineous liquid that oozes from it owes its hue to coal tar. The housewife selects a bright green broom, but finds that coal tar furnished the freshness. The product of the hen is replaced by yellow coal tar colors in custard powders, and butter is similarly tinted. One of the most novel applications is the dyeing of whole pieces of bulky furniture by dipping them into large tanks, which transforms the wood into walnut, mahogany, etc., according to taste.

Not only are coal tar colors used on this enormous scale; they are employed in a lilliputian manner for staining specimens for examination under the microscope, enabling the investigator to detect bacteria, the finest nerve ends and other minute elements of animal tissues; and by means of such staining methods, Koch discovered the bacillus of tuberculosis and cholera, and initiated the modern battle against infectious diseases. Some of the dyestuffs are of great value as internal remedies; methylene blue, for instance, being strongly recommended for relief of pain in cancer. Salicylic acid, the important remedy against rheumatism, is derived from coal tar: the same is true of antipyrin, and dozens of other synthetic remedies.

Shortly after the introduction of antipyrin a curious accident gave this modern art an unexpected stimulus. A physician sent to a drug store in Germany for chemically pure naphthalene, to be used for a patient suffering with skin disease. The substance, when received, was found to fail of the expected effect, but it promptly reduced the existing fever. When the supply was exhausted the doctor sent for more, and found, to his surprise, that it had no such action. Investigation showed that the drug clerk had accidentally sent acetanilid instead of naphthalene on the first order—a mistake that resulted in the introduction of this remedy into medicine. Acetanilid is now used by the ton as an antipyretic and antineuralgic.

Another curious accident, related by Dr. Schweitzer, led to the discovery

of saccharine. Dr. Fahlberg was experimenting at John Hopkins with coal tar derivatives. On leaving the laboratory one evening he washed his hands thoroughly, and was therefore surprised to find that everything he ate at dinner tasted sweet. The cook was called to account, and discussion led to his finding that it was not the bread, vegetables, etc., that were sweet, but his own hands. He at once attributed it to some chemical he had been handling, and rushing back to the laboratory, tested the vessels with which he had been working, soon finding one that had a remarkably sweet taste. This is an interesting instance of how purely theoretical investigations may lead to the building up of an important industry. Saccharine was soon manufactured on such a large scale that it threatened the German sugar interests, and the government was obliged to interfere and permit the employment of the new sweetener only for medicinal purposes.

The manufacture of artificial perfumes has also been revolutionized since Perkin's discoveries. The singular correlation of coal tar products appears from the fact that the odoriferous principle of jasmine is derived from the same mother substance which furnishes synthetic indigo. Between the products giving the fragrance of flowers and death dealing explosives there would seem to be a broad chasm; but not for the coal tar chemist. The same nitrobenzol which was the first artificial perfume is used today with nitroglycerin as a safety explosive. Trinitro-benzol, picric acid, etc., are now employed as safety explosives by the miner, and in proper mixtures as smokeless powder by the armies of the civilized world. While coal tar preparations thus destroy life, they likewise sustain it, for by the use of salicylic and benzoic acids, it becomes possible to preserve the canned foods so indispensable to sailors and explorers.

Mention should also be made of the use of coal tar colors in the reproductive arts. Inks are made from them, and they are used almost exclusively in photography, for the development of the latest pictures on films and plates. By means of coal tar one of the greatest of all problems—photography in natural colors—has been realized.

While thus new arts were constantly developed, the chemical industries in many other lines have also been eminently benefitted. The production of aniline required quantities of sulphuric acids, and this resulted in the process in which sulphurous acid gas, instead of being allowed to escape and destroy surrounding vegetation, was converted into sulphuric acid by the oxygen of the air. The electrolysis of salt solution was economically perfected, and the experience gained in electric methods is being applied to the problem of utilizing the nitrogen of the air. All the by-products of coal tar are utilized, and one of them, sulphate of ammonia, is produced so economically that it is commonly employed as a fertilizer.

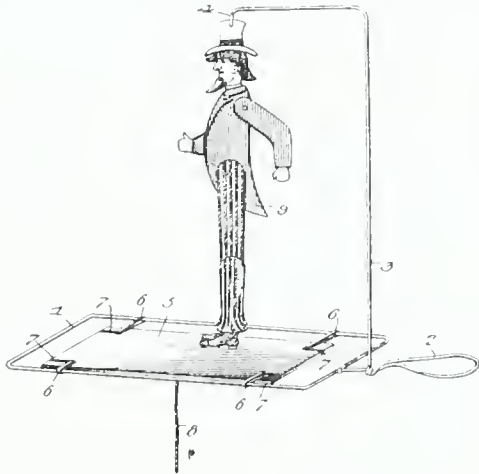
In the cooking processes, of so great importance in manufacturing iron and steel, the gaseous products are no longer allowed to go to waste, but are utilized to furnish benzol, illuminating gas, etc. In the treatment of such gases, cyanide of potassium is obtained at such low cost that it is used for extracting low class gold ores which hitherto were useless. Hence this substance plays an important part in the monetary system, as its cheap production has disposed of the fear that there would not be enough of the precious metal to maintain the gold standard of the civilized nations. These are but some of the lines in which the coal tar industry has influenced other enterprises. Considering that it is but fifty years since Sir William Perkin made his first discovery, the growth of the industry has been phenomenal.

CLEVER NEW PATENTS.

Dancing Figure Toy.—Feeders for Grain Separators.—Novel Vehicle Wheel.—Vestibule Connection for Stock Cars.—Separable Hanger or Hinge.—Swinging Gate and Operating Means Therefor.

Dancing Figure Toy.

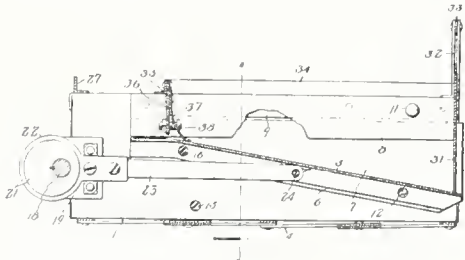
An amusing dancing toy has been patented by Messrs. Francis A. Neville and Ancel Hodges, of Meredosia, Ills. The simplicity of the toy will be evident from a glance at the accompanying illustration thereof. A



rectangular frame 1 is employed having a handle 2 at one end, with a standard 3 rising from the handle, and a jointed figure 9 suspended from the offset end 4 of the standard. This figure rests upon a vibratory platform 5 that is secured within the frame 1 by rubber bands 6. A cord 8 is attached centrally to the platform. By operating this cord, the platform will be vibrated and the figure made to perform amusing gyrations and acrobatic feats.

Feeder for Grain Separators.

Joseph Wellfe, of Hamler, Ohio, has been granted a patent on a grain feeder. The object set forth is to facilitate the introduction of grain into grain fans and the like, to conveniently regulate the discharge of grain therefrom; to mount the shaking pan in a novel manner so that the choking thereof by the grain will be prevented; and to control the operation of the shaking pan without stopping the engine or other source of power, to which the feeder is connected. The feeder consists of a hopper with a reciprocatory inclined pan working therein. As the bottom of the pan is inclined downwardly and rearwardly, the grain will be worked in that direction and discharged beneath the bottom of the gate 31 when

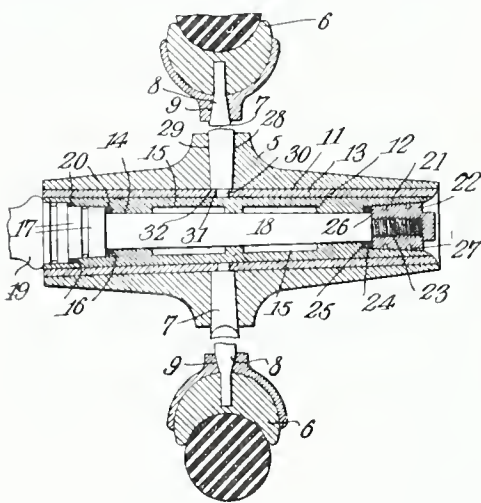


the latter is elevated. However, it is necessary to close the elevated end of the pan, so as to prevent escape of grain at this point. In addition to closing the upper end of the pan, the patentee proposes to have the closure stationary, so as to operate as a follower for pushing forwardly such grain as may collect in the upper portions of the pan. In carrying out this

plan, a plate 36 is suspended from the cross-bar 35, and to this plate there is secured an elastic plate 37, which is bowed downwardly and forwardly, with its lower free edge resting upon the bottom of the pan. A threaded adjusting device 38 pierces the lower portions of the two plates, whereby the shoe 37 may be drawn toward the plate 36, so as to maintain the free yieldable edge of the shoe in frictional engagement with the bottom of the pan, thereby to close the rear end of the pan and prevent grain working out.

Novel Vehicle Wheel.

A vehicle wheel, in which lightness, strength and durability are combined, has been patented by Mr. Jerome Bolick, of Conover, N. C. The hub of the wheel consists of an outer casing 5, within which is located an axle boxing 12 with an interposed cushion sleeve 13, the latter being preferably of wood. The axle is held in place on the spindle by a nut 22 screwed into a recess in the boxing. The casing is provided with spoke sockets in which the inner ends of spokes 7 are placed, these spokes preferably having reduced terminals 30 that pass through

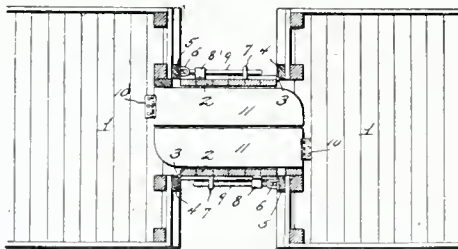


the cushion sleeve 13 and abut against the boxing. The spaced circumferential recesses 31 are disposed in alinement with the spoke receiving sockets 28 and are of less cross-sectional diameter than said sockets, so that the shoulders 32 on the spokes 7 will bear against the cushioning member 13 on each side of the recesses 31, and thus serve to receive and absorb the jar or impact incident to traveling over rough uneven roads. The outer ends of the spokes are fitted into a rim or felly 6, and rubber tires may be employed if desired.

Vestibule Connection for Stock Cars.

A patent has been granted to Messrs. Benjamin Franklin Venable and Wm. Fisher Cunningham, of Columbia, Mo., on a stock car which is so constructed that the cars will have connecting vestibules. End doors are provided in each car that are mounted to swing outwardly so as to bridge the space between the cars. Latches 9 are employed that will connect the door of one car to the end of the adjacent car, and yet permit the relative movement of the cars. These doors when swung across the space, thus constitute the side walls of the vestibule, the platform or floor of which is formed of sections 11, each section being hinged to the floor of one car

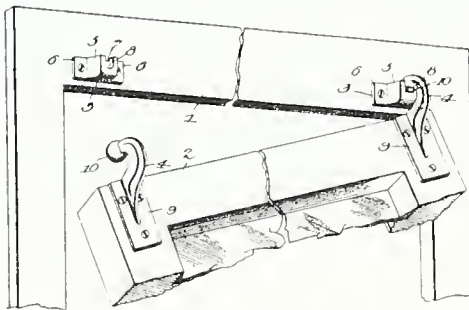
and arranged to swing across the space between the cars and rest upon the floor of the adjacent car. It will be understood that the two platform sections are capable of slight longitudinal movement with respect to each other, if the train be on a curve.



In vestibule cattle-cars as heretofore constructed, a wide platform has been provided on each car. As only one of such wide platforms could be used at a time, it was necessary to fold the other back upon the car floor to get it out of the way. This disadvantage is avoided by the construction of platform described.

Separable Hanger or Hinge.

A separable hinge, particularly useful for hanging storm windows, transoms, and the like, has been patented by Mr. Jacob Diehl, of Sheboygan, Wisc. The hinge consists of spaced socketed members 3 that are secured to the top of the casing, and are provided in their outer walls with vertical slots 7. The movable members 4, carried by the sash, are in the form of brackets that pass through the slots, and have ball heads 10, which detachably engage in the sockets of the members 3. It will be evident that these hinges will permit the free swinging movement of the sashes, and that said sashes can be

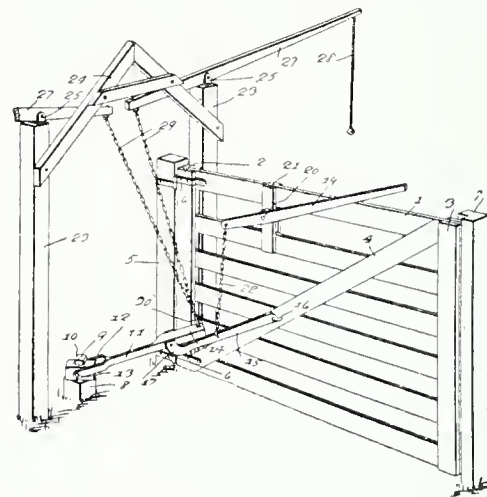


readily detached by swinging them outwardly and lifting them so that the ball heads 10 will disengage from the socketed members. It will be

noticed that the shanks of members 4 remain in engagement with the slots 8 when the sash is closed, and therefore this form of hinge is particularly desirable for use where two or more sashes are located in one casing, because no lateral play is permitted either during or after the closing of the sash.

Swinging Gate and Operating Means Therefor.

The gate herewith illustrated is the patented invention of Mr. Joseph L. Woolard, of Williamston, N. C. It will be noted that the gate 1 is hinged in the ordinary manner to a gate post 5. A vertically swinging link 11 is pivotally mounted on a rotatable block 9 disposed at one side of the gate, and this link is connected to the gate by another link 15. A hand operating lever 19 has a chain connection 22 with the link 15. Other operating levers 27 are fulcrumed on



posts 23 located on opposite sides of the gate, and these levers 27 are capable of swinging laterally. They are connected by chains 29 with the weighted end 24 of the link 11. It will be evident that if the gate is closed, it is only necessary to draw downwardly upon one of the levers, whereupon the gate will be swung to open position. In like manner, when opened, if one of the levers is operated, the gate will be returned to its closed position. By having the levers in the positions illustrated, the gate may be opened and closed without the necessity of a driver alighting from his vehicle.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

STOVER MFG. CO. v. ARCADE MFG. CO.

(Circuit Court of Appeals, Seventh Circuit.

January 2, 1906. 143 F. R. p. 126.)

PATENTS—INFRINGEMENT—MOP STICK.

The Stewart patent, No. 499,402, for a mop stick, as limited by the prior art, held not infringed.

HALL SAFE & LOCK CO. et al. v.

HERRING-HALL-MARVIN SAFE CO.

(Circuit Court of Appeals, Seventh Circuit.

January 11, 1906. 143 F. R. p. 231.)

1. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION.

Defendant's predecessors in business for many years were the Chicago representatives of Hall's Safe & Lock Company and of complainant, its successor in business, and at all times kept conspicuously displayed at their store and on their stationery the words "Hall's Safe" and the trade-name "Hall," as required by their contracts. Later defendant corporation was organized under the name "Hall Safe & Lock Company," took over the business, and continued the same signs and displays, but terminated the contracts with complainant and engaged in the sale of safes of another manufacture. There was no person by the name of Hall connected with the company. Held, that such action tended to deceive the public and injure complainant by using the reputation acquired by its safes for selling those of a competing manufacturer, and constituted unfair competition which entitled complainant to an injunction.

2. SAME—USE OF NAME—ESTOPPEL BY SALE OF BUSINESS AND GOOD WILL.

One Hall and his sons established a successful business in the manufacture and sale of safes, which became well known as Hall's safes. Later they organized in corporate form as Hall's Safe & Lock Company and continued and increased the business, until it was sold by the corporation to complainant's predecessor; the instrument of sale expressly conveying its trade-marks, trade rights, and good will. The Halls, who were sons of the original founder, owned practically all the stock of the selling corporation, and by the sale became the controlling stockholders of the purchasing corporation and its principal officers for some years, during all of which time it continued to use the name "Hall's Safes" on its product. They then severed their connection with it and organized a new corporation under the name "Hall's Safe Company" and engaged in the manufacture and sale of safes marked with such name. Held, that they were estopped by the sale of the business and good will of Hall's Safe & Lock Company, which, although made in the corporate name, was negotiated by them and of which they were individually the chief beneficiaries, from using the name Hall in connection with a competing business to the injury of the purchaser, and that such use constituted unfair competition.

CINCINNATRY. SUPPLY CO. v. AMERI-

CAN HOIST & DERRICK CO. et al.

(Circuit Court of Appeals, Sixth Circuit.

February 20, 1906. 143 F. R. p. 322.)

1. PATENTS—CONSTRUCTION OF CLAIMS.

The law requires a patentee to define in his claim precisely what his invention is, and, when that has been done in plain terms, a court has no power to disregard such terms and either change or enlarge the claim by reference to the specification.

2 SAME—INFRINGEMENT—WIRE ROPE CLAMP.

The Crosby patent, No. 388,840, for a wire rope clamp, in view of the prior art, is limited to a clamp with a groove and longitudinally extending wings forming a lateral support to retain the ropes in place, and is not infringed by a clamp not having such wings.

LAFFERTY MFG. CO. et al. v. ACME RY.

SIGNAL & MFG. CO.

(Circuit Court of Appeals, Seventh Circuit.

January 2, 1906. 143 F. R. p. 321.)

1. EQUITY—BILL OF REVIEW—LEAVE TO FILE.

Leave to apply to the Circuit Court for permission to file a supplemental bill in the nature of a bill of review for the purpose of introducing newly discovered evidence will not be granted by the Circuit Court of

Appeals after it has determined the cause on appeal, unless the newly discovered evidence offered, had it been in the original record, would have probably changed the conclusion to which the court came and the decree entered thereon.

2. SAME—NEWLY DISCOVERED EVIDENCE.

The Circuit Court of Appeals will not grant leave to apply to a Circuit Court for permission to file a supplemental bill in the nature of a bill of review to bring forward newly discovered evidence where the proofs show that such evidence was in existence and accessible prior to the original hearing in the cause, and that the probable reason why it was not produced is that it was not deemed material by counsel.

W. F. BURNS CO. v. MILLS et al.

(Circuit Court of Appeals, Seventh Circuit.

January 2, 1906. 143 F. R. p. 325.)

PATENTS—INVENTION—SAVINGS BANK.

The Mills & Cunningham patent, No. 725, 858, for a metal savings bank, the essential feature of which is a tube extending into the bank and having a circular row of integral teeth on its inner end, so that a bill inserted into the bank through such tube cannot be extracted because of engagement with the teeth, is void for lack of invention; tubes of practically identical form having been previously used in animal traps for a similar purpose.

HARRINGTON et al v. ATLANTIC & PACIFIC TELEGRAPH CO. et al.

(Circuit Court, S. D. New York. January

25, 1906. 143 F. R. p. 329.)

1. COURTS—JURISDICTION OF FEDERAL COURTS—SUIT ARISING UNDER PATENT LAW.

Where a suit involves the question of infringement of patents, it is one arising under the patent laws and within the jurisdiction of a Circuit Court of the United States by virtue of Rev. St. § 629, cl. 9 [U. S. Comp. St. 1901, p. 504], although it also involves the question of the ownership of the patents or other contract rights.

2. TRUSTS—ESTABLISHMENT AND ENFORCEMENT—FOLLOWING TRUST PROPERTY.

To carry out an agreement between complainants, who were owners of certain patents, and the controlling stockholder in defendant corporation, acting in its behalf for the transfer of the patents to the corporation in exchange for a stated amount of its stock, an absolute assignment of the patents was made to such stockholder, but accompanied by written directions that they should not be conveyed to the corporation until it delivered to him the stock, and also directions for the distribution of the stock by him between complainants and others, for whom they were trustees. He assented to the arrangement, but thereafter conveyed the patents to the corporation, ignoring the conditions, which were never performed. Held, that he took and held the title to the patents as trustee only; that his assignment to the corporation in violation of the trust, of which the corporation had knowledge, was ineffective to convey the title or to protect it from a suit for infringement because of its use of the patented devices; and that such a suit was one arising under the patent laws, within the meaning of Rev. St. § 629, cl. 9 [U. S. Comp. St. 1901, p. 504], of which a federal Circuit Court was thereby given jurisdiction, although it incidentally sought other relief by compelling a reconveyance of the patents.

3. PATENTS—INFRINGEMENT BY CORPORATION—LIABILITY OF STOCKHOLDER.

The owner of the majority of the stock of a corporation, who controlled its affairs and who transferred to it certain patents in violation of a trust under which they had been conveyed to him by the owners, is equally liable with the corporation for its infringement of the patents by the use of the patented devices.

THRESHER v. GENERAL ELECTRIC CO.

(Circuit Court, N. D. New York. February

7, 1906. 143 F. R. p. 337.)

1. PATENTS—SUIT FOR INFRINGEMENT—PLEA.

In a suit in equity for infringement of a patent, the defense of noninfringement cannot be made by plea, except under extraordinary or very special circumstances, and while it may be within the discretion of the court to permit the defense of prior invention to be raised by plea to justify such practice, it should appear with reasonable certainty that the determination of the plea will end the case.

2. SAME.

In a suit in equity for infringement of a patent, a plea alleging that prior to the alleged invention by complainant of the de-

vice covered by the patent another invented and disclosed the device made and used by defendant which is claimed to infringe, and with reasonable diligence made an application for a patent therefor which is still pending, is bad since it does not go to a single point, nor reduce the case to one point, but to two points, viz., possible prior invention, if the two devices should be shown to be the same, and possible noninfringement, if they should be shown not to be the same.

NATIONAL CASH REGISTER CO. v.

UNION COMPUTING MACH. CO.

(Circuit Court, D. New Jersey. February 19,

1906. 143 F. R. p. 342.)

1. PATENTS—INFRINGEMENT—CASH INDICATOR AND RECORDER.

The Koch patent, No. 398,625, for a cash indicator and recorder, claim 3, must be narrowly construed, and, as so construed, held not infringed.

2. EQUITY—DEFENSE OF LACHES—HOW RAISED.

Laches is a defense which need not be pleaded but may be raised upon the argument, or, when found to exist, the court itself may be passive and deny relief.

3. PATENTS—SUIT FOR INFRINGEMENT—LACHES.

Unexcused and unexplained delay in bringing suit for infringement of a patent for 11 to 12 years after notice of such infringement, and when in the meantime the business of the alleged infringer had been transferred to another, constitutes acquiescence in the infringement, if any, or culpable laches, and estops the complainant from relief in equity.

MYGATT v. McARTHUR et al.

(Circuit Court, S. D. New York. February

7, 1906. 143 F. R. p. 348.)

1. PATENTS—INVENTION REFLECTOR FOR INCANDESCENT LAMPS.

The Goodchild patent, No. 634,295, for a reflector for incandescent lamps which fits over and is removably supported by the flaring upper portion of the lamp bulb, is void for lack of patentable invention, in view of the prior art.

2. SAME—DESIGN PATENT—LAMP REFLECTORS.

The Mygatt design patent, No. 35,755, for a design for a reflector for artificial lights, was not anticipated, and discloses invention. Also held infringed.

KEASBEY & MATTISON CO. v. AMERICAN MAGNESIA & COVERING CO.

(Circuit Court of Appeals, Third Circuit. January 24, 1906. 143 F. R. p. 490.)

1. PATENTS—ORIGINAL INVENTOR—MACHINE FOR MOLDING PIPE COVERINGS.

Evidence considered, and held insufficient to overcome the presumption arising from the granting of the patent, that the patentee was the original inventor of the machine of the Keasbey patent, No. 397,860, for molding tubes or cylinders for covering steam pipes.

2. SAME—VALIDITY—DESCRIPTION OF MACHINE.

A patent for a machine, described as one for molding tubes or cylinders, is not invalid, because in the use of the machine it makes only half tubes or cylinders capable of being fitted together and so designed.

3. SAME—INFRINGEMENT—MACHINE FOR MOLDING PIPE COVERINGS.

The Keasbey patent, No. 397,860, for a machine for molding tubes or cylinders from plastic material such as are used for covering steam pipes, was not anticipated by anything in the prior molding art, from which the machine of the patent differs essentially, owing to the difference in the materials used and the requirement of uniform density to render the product non-conductive and serviceable for pipe covering, and the patent discloses patentable invention. Claim 1 also held infringed.

MISSISSIPPI GLASS CO. v. FRANZEN.

(Circuit Court of Appeals, Third Circuit.

February 2, 1906. 143 F. R. p. 501.)

1. WITNESSES—PARTY CALLED BY OPPOSITE PARTY—RIGHT TO CONTRADICT TESTIMONY.

A party who calls the opposite party as a witness is not concluded by his testimony, but may contradict him.

2. PATENTS—CONTRACT TO ASSIGN—EVIDENCE CONSIDERED.

Evidence considered, and held to fairly sustain the claim of complainant that certain inventions, made by defendant, and for which he applied for patents after leaving

complainant's employment, were made during the term of such employment, and were within the terms of a contract by which he agreed to assign to complainant all rights to any inventions made by him while the employment continued.

3. SPECIFIC PERFORMANCE—CONTRACT TO ASSIGN INVENTIONS—CONSIDERATION AND MUTUALITY.

A written contract by which he agreed, in consideration of his employment at a stated salary, to assign to him all inventions made by him during the term of his employment, which was terminable at any time by either party on notice, is based on a sufficient consideration, and does not lack mutuality, and is specifically enforceable in equity, where it has been fully executed by the employer by retaining the employee until he voluntarily left its service.

CIMIOTTI UNHAIRING CO. et al. v.

BOWSKY.

(Circuit Court of Appeals, Second Circuit.

December 5, 1905. 143 F. R. p. 508.)

1. PATENTS—INFRINGEMENT—MACHINE FOR REMOVING HAIRS FROM FUR SKINS.

The Sutton patent, No. 383,258, for a machine for removing hairs from fur skins, claim 5 considered, and held infringed.

2. SAME—PROFITS.

A finding as to the profits made by a defendant by the use of an infringing machine, sustained, where it accorded with his own testimony given in another suit.

IRONCLAD MFG. CO. v. DAIRYMAN'S

MFG. CO. SAME v. ORANGE COUNTY

MILK ASSOCIATION.

(Circuit Court of Appeals, Second Circuit.

February 1, 1906. 143 F. R. p. 512.)

PATENTS—INFRINGEMENT—MILK CANS.

The Haigh patent, No. 607,433 for a milk can, is limited to the specific means shown for uniting the reinforcing neck portion with the neck portion of the body of the can, by an interlocking flange, as its only novel feature, in view of the prior art, and it is not infringed by a construction which does not employ such interlocking means.

PARRAMORE v. SIEGEL-COOPER CO.

(Circuit Court of Appeals, Second Circuit.

December 5, 1905. 143 F. R. p. 516.)

PATENTS—INVENTION—STOCKING SUPPORTER.

The Parramore patent, No. 629,391, for a stocking supporter, claims 1 and 2, are void for lack of patentable invention in view of the prior art, if not fully anticipated by the Andrews patent, No. 550,551.

MORRIN v. ROBERT WHITE ENGINEERING WORKS.

(Circuit Court of Appeals, Second Circuit.

December 5, 1905. 143 F. R. p. 519.)

1. PATENTS—INFRINGEMENT—REPAIR OR RECONSTRUCTION.

The Morrin patent, No. 463,307, for a steam generator covers an invention, the only novel and patentable feature of which is the peculiar ogee shaped generator tubes, and the replacing of all such tubes in an old generator constitutes a reconstruction, and not repairs, and infringes the patent.

2. SAME—STEAM GENERATOR—REPLACEMENT OF TUBES BY USER.

The purchaser of a patented machine is entitled to make necessary repairs, and to replace worn out parts not separately patented so long as the identity of the licensed machine is not destroyed, and such repairs may be made by himself or by any one employed by him. In case of a steam generator having a number of tubes of peculiar shape, which constitute the only patentable feature of the structure, while a purchaser and user is not entitled to reconstruct all of such tubes, he has the right to replace one which becomes burned out or otherwise inoperative without infringement, and the limit of his right between these extremes is a question to be determined on the facts in each case under the above rule.

BRADLEY v. ECCLES.

(Circuit Court of Appeals, Second Circuit.

February 8, 1906. 143 F. R. p. 521.)

1. PATENTS—INVENTION—USE OF OLD DEVICE IN DIFFERENT COMBINATION.

The use of a ball and socket joint to accomplish the same purpose for which it had previously been used in the same art, in a different but old combination, does not constitute invention.

2. SAME—THILL COUPLING.

The Bradley patent, No. 485,856, for a thill coupling, is void for lack of patentable novelty.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

Nellie R. Hull, Asheville, N. C. Powder Puff—This patent provides a powder puff designed especially for use on a dresser, or in a nursery, and adapted also to be conveniently carried in the pocket, or in a chatelain bag, without soiling the clothes, and capable of being instantly opened to afford access to its interior, either to supply it with powder, or to enable the same to be directly obtained from the puff without passing through the material. The powder puff, which is also adapted to contain a supply of sachet powder, perfumery or the like, is formed with a plurality of superimposed compartments or pockets, provided at a common point with entrance openings, and having a plurality of flaps to close the pockets. The entrance openings of the pockets are outwardly tapered and the foldable flaps are tapered inwardly, so that they will be securely retained in the pockets, when the powder puff is closed.

George D. Coddington, Heno, Ohio, inventor; Ball Bros., Glass Manufacturing Co., Muncie, Ind., assignees. Wax Coated Sealing Rings and Machines for Coating the same. Three patents. — The first patent covers a sealing or packing ring, designed especially for use in connection with fruit jars, particularly the well known "Mason" type of jar and cover, and fusible under the action of heat of a freshly filled jar, so as to form a hermetical seal between the neck of the jar and the cover. The packing or sealing ring consists of a single inelastic ring of hard material, having sufficient body to retain its ring-like shape without a packing, and provided at its opposite faces with exterior coatings of adhesive material of sufficient thickness to form pliable or yieldable surfaces for engaging and sealing a jar and its cover.

The second patent is directed to a machine for manufacturing the packing or sealing ring of the first patent, and the machine is adapted to apply the sealing material in a heated condition to previously stamped or cut rings of card-board, and it is provided with means for cooling the sealing material after the same has been applied to the rings. Means are also provided for coating the rings with non-adhesive material to prevent the same from adhering to each other, when put up in packages. The machine comprises a receptacle for sealing material, a plurality of conveyers each consisting of a pair of endless belts having contiguous flights arranged to clamp the rings, and located within the receptacle to carry the rings through the sealing material, heated rolls arranged to receive the rings from the conveyers for spreading the sealing material uniformly over the surfaces of the rings, and a trough containing a cooling liquid in which the rings are submerged by an endless conveyor to set and harden the sealing material. The rings also pass between rolls, one of which is partially submerged in a receptacle containing a liquid solution of powdered material. A drying device for removing water from the rings is also employed, and the rings, when completed, are received within hoppers having movable doors or closures. The rings are discharged from the hoppers in bunches of a predetermined size, the discharging means being automatically controlled by the rings.

The third patent relates to a device for feeding the uncoated paste board rings to the machine of the second

patent. The device, which is adapted to hold a bunch of rings, enables the same to be positively fed one at a time to the mechanism for carrying the rings through the sealing material, and it also permits a bunch of rings to be quickly applied to it. This improvement embraces an inclined resilient holder arranged to extend through a plurality of rings, and adapted to be flexed or bent away from its normal position to permit the rings to be fed by a vertically reciprocating slide or carrier, located at the lower end of the holder and co-operating with the same. The vertical reciprocating slide is provided with means for successively engaging the rings to remove the same from the holder, and a hopper is arranged to guide the rings to the carrying mechanism of the coating machine.

James E. Guinn, Lehanon, Mo., inventor; Adam Wackman, assignee, St. Louis, Mo. Draft Rigging for Cars.—This is the second patent in this line obtained by this inventor. The latest arrangement is designed to retain all of the advantages of the earlier construction, but is also capable of employment in connection with cars equipped with slotted or filled bolsters. The body bolster comprises upper and lower members and an intermediate member. The draft timbers and an intermediate filling block have their rear ends disposed between the upper and lower members of the bolster, and are abutted against the intermediate member thereof. A spring pocket is disposed with one end between the members of the bolster and likewise abutted against the intermediate member. In this spring pocket is located a draft spring which is hatched by the intermediate member of the bolster. A cross-head is so mounted that its movement in one direction is resisted by the draft spring, and to this head is connected a drawbar, the rearward movement of which is cushioned by a buffer spring interposed between said bar and the filling block.

Adam Wackman, St. Louis, Mo. Draft Rigging for Railway Cars.—This patent covers a draft rigging which is a further development along the line of the last patent to James E. Guinn. The Wackman construction, with the exception of the filler blocks, is entirely of metal, the assemblage of parts, preferably constructed of cast steel, being bolted in a rigid organization which adds great strength to the car structure and is capable of being easily installed and repaired. The usual draft timbers are eliminated. In their stead, metal draft beams extend continuously the entire length of the rigging both in front and in rear of the bolster, and are interlocked with the latter. In order to prevent the shearing of the securing bolts, an interlocking engagement is effected between the beams and the car sills so that the strain is imposed upon the sills and thus directly upon the car structure, instead of upon the bolts which secure the rigging in place. The buffer and draft springs are located in front and rear of the bolster, and bear upon cross-heads connected by metal bars extending along the outer sides of the beams, the drawbar having connection with the front cross-head so as to be cushioned in both directions by the springs.

Frank Schacht, Lime Springs, Iowa, Pneumatic Grain Elevator.—The Schacht elevator is of the pneumatic type in which the grain is fed by a blast of air induced by a fan or blower. The bruising and breaking of the grain which is usually incident to its violent contact with the fan, is avoided by feeding the grain from the hopper to the blast at a point removed from the fan so that the grain never comes in contact with the fan, but is

effectively elevated by the blast induced thereby. In addition to this feature, the elevator is equipped with automatic governing means which will insure the feeding of the grain to the fan casing when the fan is rotating at a proper rate of speed, but will otherwise prevent the feed of the grain. The grain hopper is equipped with a spiral feeder employed in connection with a guard sleeve, which will prevent the gravitation of the grain to the fan casing when the feeder is at rest.

Milton T. J. Ochs, Allentown, Pa. Boiler Setting.—The primary object of this setting is to so construct and mount the front, rear and side arches that the contraction and expansion of the boiler will be accommodated without liability of derangement. The boiler is supported independently of the walls of the setting, and the latter are formed of ledges which support the lower and outer edges of the arches, the upper inner edges of which rest against the boiler. Each of the arches is formed in a series of honnet sections extending the entire width of the arch, to wit, from the upper to the lower edge thereof, so as to absolutely prevent the collapse of the arch upon the crumbling of the bonnet as in ordinary constructions. The arches are capable of movement independently of the walls, so that when the boiler expands they merely move back and return to their normal positions without endangering their integrity when the boiler contracts.

T. B. Parkinson, Muncie, Indiana. Process for Treating Mineral Wool.—This process is intended to produce mineral wool from the slag or scoria of iron, glass, certain species of rock, and other suitable substances, by means of instrumentalities which will produce filaments or fibres of considerable length, great toughness and of fairly soft texture. A special object of the invention is to eliminate the small bead like particles usually found in large quantities in mineral wool and due to the imperfect vibration of the scoria. The process consists in blowing the hot slag or scoria in the usual manner, and in subjecting the material in transit to the action of smoke and steam. The process may be carried out by means of an open-ended tube or conduit through which the scoria is blown, and into which steam and smoke are injected and brought into contact with the scoria during the vibration thereof.

Henry C. Luecke, Wichita Falls, Texas. Gang Plow.—The object of this invention is to produce a plow having a compact and durable frame structure composed of inexpensive separable elements, capable of being organized in a rigid structure without necessity for the employment of skilled labor. Another object is to provide for the greater or lesser number of plow units in the gang or series, and to provide as a rear support for the plow a rear furrow wheel associated with adjusting means for raising or lowering the rear end of the plow to regulate the depth of cut, and of additional adjusting means arranged to shift the crank axle of the wheel to properly resist the side draft of the plow and to aid in directing the latter in four-side plowing in order that comparatively sharp corners may be turned. In addition to a simple structure which accomplishes the objects stated, a series of rotary coulter discs are associated with the plow elements, and serve to cut through vines, brush, or other similar obstructions in advance of the plow.

John E. Graham, Greenville, Mich. Mail Box.—It is a well known fact that to be successful, a rural free delivery box must be so constructed that it can be opened, closed and the

signal properly positioned with the least possible amount of work and expenditure of time. The present device is unique for its simplicity and efficiency in this respect. The body of the box has a hinged cover, and a spring secured at one end to the cover, and a block pivotally mounted on its other end. A standard is fastened between its ends to the block, one end of the standard being provided with a latch that engages the body, and with a handle. The other end has a pivoted signal thereof. The signal is so arranged that when the standard is swung downward to unfasten the cover, the signal strikes a plate at the top of the box and is automatically swung to a position at right angles to its first position, so that when the standard is again raised, in locking the box, the signal has assumed a different position. The operation of the signal is therefore entirely dependent on the locking and unlocking of the box.

Lodrick Williams and Gust Johnson, Doe Run, Mo. Coupling.—The patent on this invention has been purchased by The Doe Run Lead Co., of Doe Run, Mo., and said invention is particularly useful in connecting diamond drills to feed screws. The device is very simple and compact, and at the same time constitutes a strong and rigid coupling or chuck. A body is employed having a bore therethrough with sockets extending through opposite walls of the body to the bore. Jaws are pivoted on the body and fit in the sockets. A locking bolt is pivotally connected to one jaw, and detachably connects with the other for securing the jaws in the sockets. These jaws are provided in their inner sides with seats that receive dies having teeth cut at right angles to each other. The teeth are thus arranged to clamp the device placed in the bore, and prevent both rotary and longitudinal movement of the same.

Alvin H. Hoffman, Lincoln, Nebr. Target Trap.—The present device can be employed for throwing ordinary tin cans for targets. These tin cans are easily obtainable and capable of being used repeatedly. The device is a simple one, and consists of a target carrying arm associated with a vertically disposed magazine for the cans. The magazine has an open lower end at which is disposed a pivoted support. The throwing arm is arranged to engage the support when swung downwardly and tilt the same so that the lowest of the pile of cans will be moved to the throwing arm. Actuating means for the throwing arm consists of a spring, and said arm is moved to its set position by a lever having a dog, which is automatically released when the lever is moved after the arm has been placed in its set position.

Michael Stieff, inventor; The Safety Storm Front Co., assignee, Toledo, Ohio. Storm Cover.—The patent covers an improvement in storm fronts arranged to be placed over the front portion of a vehicle to protect the occupants thereof from the elements during stormy weather. It consists of a bow having means for attachment to the top bow of a vehicle. Pivotally and adjustably mounted on this bow is a hood comprising a frame that is covered with water-proof fabric. A strap connects the hood and the upper portion of the bow, and limits the movement of the former. With this arrangement, in fair weather the hood can be swung backwardly into the top where it is out of the way, but in stormy weather it may be swung forwardly, so that it closes the front of the top and extends over the dashboard. The hood is provided with a window, and with an opening of novel form through which the reins can be passed.



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New Uses for Milk.

A characteristic feature of twentieth century economy is the utilization of by-products of industries which were formerly treated as waste. Skimmed milk, long thought to contain hardly enough nutrition to warrant feeding it to hogs, has now been found to hold a substance which has given rise to a new enterprise. When the cream is taken from the milk to manufacture butter, there remains, besides lactose and mineral elements, a certain quantity of casein—about an ounce per quart of milk. This casein is employed in the manufacture of high-toned paper, playing cards, and, after undergoing transformation into a special kind of gum, in the stiffening of textiles. In the dyeing industry, also, it can be used in place of albumin to fix mineral colors, and in commerce it furnishes colors composed of casein, hydrate of lime and coloring matter. Specially prepared and pulverized, it offers a nutritious and easily digestible food.

But it is principally in the manufacture of a sort of artificial ivory, that the casein is found to be valuable. This is an excellent substitute for celluloid, and has been given the name of milk stone, or galalith. It is obtained by hardening the casein by means of formaldehyde, the combination yielding a substance that is hard, but as easy to work as wood. More brilliant and more solid, though a trifle heavier than celluloid, milk stone possesses two important advantages over the latter: it is cheaper, and it is non-inflammable, a quality that will be generally appreciated. Celluloid being composed of camphor and gun cotton, ignites with startling suddenness, and has given rise to many accidents.

Articles in great variety may be manufactured from milk stone, such as penholders, combs, hair pins, piano keys, buttons, cigar holders, knife handles, clasps, cane and umbrella handles, bowls for razors, backs for brushes, paper knives, seals, chess figures, dominoes, dice, inlaid ornaments for fine furniture—in short, any

object to which it is desired to impart polish and solidity. It may be produced in all colors, various imitations of marble, turtle shell, amber, corals, etc.

The preparation of this substance—which in consequence of its properties might be classed among the most precious natural products—is based upon simple principles. To the skimmed milk contained in large reservoirs, active rennet is added, which coagulates the albuminoid matter. The curd thus obtained is pressed, powdered, and dried in an oven, giving a very hard substance, yellowish white in color, with a slight odor of cheese. This casein is treated by repeated washings, dissolutions and precipitations until it becomes of transparent whiteness and practically odorless. It only remains to harden it by the use of formaldehyde, as described above.

The manufacture of milk stone has already become a flourishing industry in Europe, the establishments being situated near large co-operative dairies. As patents covering the process have been obtained in the United States, we will probably soon have a chance of judging for ourselves the merits of the new product.

A Protective Armor.

The attempt to give the modern soldier, in the midst of new projectiles and war appliances, a protection similar to that enjoyed by the soldier of the Middle Ages, is worthy of note on the side of curiosity, if nothing more. A cuirass invented by an Italian has received considerable attention from the press both in Europe and America, and was exhibited to the President. The inventor, Benedetti by name, really seems to have hit upon some principle of protection hitherto unapplied. A writer in Cosmos, who accepts unreservedly the reports of the remarkable performances of the Benedetti shield in the stoppage of bullets, suggests a method of making a protector which would have much the same effect. His experiments can be performed by any one with no apparatus, but a pad of paper and a pistol. He says that the authors who tell us of the conquests of Cortez relate that to protect his soldiers from the arrows of the Mexicans, which could pierce the cuirasses of hammered iron that they wore, he replaced these with thick breast-plates of wool pressed between two layers of linen. In fact, he practically covered his men with mattresses, and thus they were enabled to defy the arrows and lances of the Mexicans. This, the writer continues, is the ancestor of the Benedetti cuirass. The inventor has employed the same principle, but has perfected it by his study of the elastic resistance possessed by substances that have air within their cells. He probably reached the conclusion that with smaller cells and thinner layers of air, the more considerable would be the elastic force of the air thus compressed and the greater the resistance of the shield.

The experiment can be easily reproduced. Take a revolver of any cali-

ber and fire at a board. The ball will penetrate to a depth that varies according to the resistance of the wood, the caliber of the ball, and its momentum. With the same weapon fire at an office calendar, having 365 leaves lightly pressed together. The same ball can scarcely penetrate the first few leaves, and will in a manner rebound, falling on the ground below the target. This is the first edition of a protector which, while it may not be that of Benedetti, resembles it in its effects.

Take now two of these calendars, one of thick paper, the other of much thinner sheets. Fire at the same distance, with the same weapon, and under the same conditions of incidence. The ball will enter more deeply into the thick than into the thin calendar, and after a series of comparative experiments it is shown that the lighter the paper, the less the penetration of the projectile. It is thus seen that the thickness of the paper plays an important part in the protective action, and that it protects better, the lighter it is. It is clear that this protection is due solely to the elasticity of the layer of air that is imprisoned between the successive sheets. If one of these pads is subjected to high pressure in a vacuum to extract all the air, the block will become massive and compact, and will behave almost like a block of hardwood of the same thickness, allowing the ball to penetrate more or less deeply.

The same experiment may be repeated with a dagger, which will pierce a wooden door, but cannot pierce a calendar of the same thickness. It is also well known how difficult it is to drive a nail into a pad of paper: and if the experiment be made, it will be seen that the difficulty increases with the thinness of the sheets.

From these experiments, which every one can readily perform, it is easy to see the special mechanism of this protective effect. It is due to the elasticity of the layers of air between the sheets of paper. This air cushion is the more elastic and reacts the more intensely the thinner it is. This fact should be studied scientifically, and may well be the basis of the impenetrability of the Benedetti shield.

Benedetti declares that his cuirass is made of a kind of felt: but it should be noted that to the eye it appears flexible, homogeneous, and without apparent roughness, which excludes ordinary felting. In view of the deadly nature of modern warfare, and the advance made in the character of offensive weapons, any invention of a protective or defensive nature requires general interest.

Fishing with Microphone.

A new device is being employed in herring fishing, to find out whether the fish are near at hand. A microphone, an instrument that magnifies sound, attached by wire to a common receiver, is lowered into the water. The man at the receiver can readily tell if the fish are passing near, as the instrument makes the small noise of the shoals easily discernible.

Accidental Discoveries.

Many of the most important discoveries are due to chance. The part played by accident in human progress is important, although in many cases it was the witnessing of the accident by an intelligent thinker that led to the discovery. Many apples had fallen to the earth unnoticed, before Newton deduced from the incident the law of gravity. Thousands of persons had seen chandeliers sway, but it took a Galileo to recognize the meaning, and to discover the pendulum. But there are other instances almost as well known, in which fortunate chances have opened the way to the finding out of important truths. An alchemist, seeking to discover a mixture of earths that would make the most durable crucibles, one day discovered that he had made porcelain. The power of lenses as applied to the telescope, was discovered by a watchmaker's apprentice. While holding spectacle glasses between his thumb and finger, he was startled at the suddenly enlarged appearance of a neighboring church spire. Mezzotint owes its invention to the simple accident of the gun barrel of a sentry becoming rusty with dew.

The art of etching upon glass was found by a Nuremberg glass cutter. A few drops of aqua fortis fell upon his spectacles. He noticed that the glass became corroded and softened where the acid had touched it. He drew figures upon glass with varnish, applied with corroding fluid, then cut away the glass around the drawing. When the varnish was removed, the figures appeared raised on a dark ground.

The art of lithography was perfected through suggestions made by accident. A poor musician was curious to know whether music could not be etched upon stone as well as copper. After he had prepared his slab, his mother asked him to make a memorandum of such clothes as she proposed to send away to be washed. Not having pen and ink convenient, he wrote the list on the stone with the etching preparation. Later, when about to clean the stone, he used aqua fortis, and noticed that the writing stood out in relief. There remained only to ink the stone and take off an impression.

The process of whitening sugar was discovered in a curious way. A hen, that had gone through a clay puddle, went with her muddy feet into a sugar house. Wherever her tracks were left, the sugar appeared white, and this led to experiments, with the result that wet clay came to be used in refining sugar.

The origin of tinted paper was a slip of the hand. The wife of an English paper maker let a blue bag fall into a vat of pulp. Her husband was so incensed over the peculiar color of the paper that she was afraid to confess her agency in the matter. The man kept the damaged paper for years, and finally shipped it to London to be sold for anything it would bring. Being a novelty, it was disposed of at an advance over market prices, and orders were sent for further invoices. The manufacturer

was in a dilemma, but happening to mention it to his wife, she told him about the accident. He kept the secret, and made a fortune.

It was chance that led to the discovery of the method of transferring handwriting to iron. An iron founder, while experimenting with molten iron, under different conditions, accidentally dropped a ticket into a mold. He presently found that the type of the ticket was transferred to the iron in distinct characters. Following up the idea which this fact suggested, he procured a heatproof ink with which he wrote invertedly on ordinary white paper. This paper was introduced into the mold before the molten iron was poured in. When the mold cooled, the paper had been consumed by the heat, but the ink, which had remained intact, had left a clear impression on the iron. These are but a few of the instances in which nature has, through the medium of chance, told her secrets to man.

Tastes of Mosquitoes.

The mosquito has of late years been receiving an amount of attention proportionate rather to the annoyance he is capable of causing, than to his size. All over the world, scientists have been studying this sanguinary insect, and the latest discovery is in regard to his preferences for color. It is reassuring to learn that if we dress ourselves with special regard to the prejudices of this pest, we have a chance of escaping his attentions. Mosquitoes, it is stated, are strongly influenced in choosing their victims by the color of their clothes. Years ago it was found that a mosquito net of white was more effective than one of dark weave; and it has even been noted that the insects prefer to alight on black soil than on white sandy soil, and on black shoes than on tan or white ones. Observations made in parts of the world as widely separated as Madagascar, India and Italy, prove that light dogs are tormented less by the predatory insects than black ones, and that negroes suffer more from their bites than do Europeans. Careful experiments with large numbers of the anopheles maculipennis show their exact preferences for color as follows: Dark blue is the favorite, with dark red a close second; brown red, black, grays and violet green follow in order, while azure, ochre and white are decidedly distasteful, and yellow is abhorrent. A Swiss expert on malaria has just confirmed these conclusions, adding that of 152 mosquitoes experimented upon, nearly three-fourths settled by preference on dark colors.

New Artificial Rubber.

With the growing scarcity of supply and consequent high prices of natural rubber, together with the greatly increased consumption due to the demand for this material for automobiles, flying machines, etc., there has come an access of activity in the search for substances to replace it. Artificial rubbers have not yet proved very satisfactory, but something may be discovered any day that will meet the

requirements of the market. The latest is artificial rubber made from cereals—wheat, corn, etc.—which is said to be capable of use for vehicle tires, golf balls, and for similar purposes. The new rubber, it is explained, is obtained by treating any cereal with phyalin. Six grades are prepared from a liquid solution, suitable for waterproofing to a hardness available for golf balls. In the latter, the new rubber is credited with the lightness of cork and the toughness of chilled steel. The intermediate grades are expected to be serviceable for tires, tubes, linoleum, and slabs for pavements.

Fireproofing Celluloid.

It is good news to those who employ articles made of celluloid—and nearly everyone uses it in some form—that a method has been patented for rendering it proof against fire. The result, it is said, is obtained by adding to a mass of celluloid in course of preparation, when at the highest point of liquidity, a quantity of salts—phosphates, bicarbonate of ammonia, or magnesia. Celluloid thus prepared, when touched by flame, gives off a gas that checks combustion. Immersion of celluloid in a solution of any of the above named salts reduces its inflammability.

A New Wax.

The busy bee is about to find a rival in producing wax. A report comes from Madagascar that in the leaves of the rafia palm there has been discovered a product which, by its chemical and physical properties, might be classed as a kind of wax, and promises to equal the substance which results from the industry of the bee. Experiments are now being made to ascertain its availability for bottling purposes, as well as for graphophone cylinders, etc.

The process of extracting the wax, it is said, is simple. The natives obtain the fiber from the palm by beating the dry leaves on a mat and gathering the particles and powder that fall from them. These are boiled, and the resultant wax is kneaded into cakes of any form. The wax is said to be very pure, and will probably become a valuable commercial product.

New Process of Steel Making.

The introduction of a new process in the manufacture of steel into important works in Bohemia may bring about a revolution in the industry in that country. The new method, which is called the Kjellin process, yields an excellent steel, said to be fully equal to the best crucible steel, while the cost of production is considerably lower than with the mode now employed. The Kjellin product, however, apart from its lower cost, is praised for its ductility, density, homogeneity, softness, excellent magnetic properties, and also for the possibility of obtaining high degrees of carboniferous quality. If these surmises are proved by facts, those companies which have at their disposition the first requisite for the

adaptation of the electric process—viz., cheap water power—will secure a great advantage. It is declared that the Kjellin process can compete with the Siemens Martin method where the kilowatt hour can be put down at about a half cent.

Cotton vs. Flax.

King cotton has been gradually encroaching upon the domain of linen until at last the latter has been almost forced from the general market. The increasing cost and insufficiency of supply of the material used in the manufacture of linen, together with the cheapness of cotton, its general availability, and above all the popularity of the new methods of mercerization, have had the effect of gradually placing linen goods among articles of luxury. Cultivators of flax have been much disturbed at the situation, and have been trying to reduce expenses of spinning, and to utilize all of the flax waste. No little success has been attained by interweaving cotton and flax yarns, resulting in a cloth unrivaled as a fancy shirting, one that gives satisfaction in both appearance and wear, and costs only a little more than cotton goods and much less than pure linen.

But the most effective aid to the linen industry has come in the form of a new invention for spinning flax, which is in substance little more than the application of the method of spinning cotton to the other fiber. It consists in replacing the cumbersome machinery now necessary in flax spinning by self-acting reels, such as cotton workers employ. The machinery differs little in appearance from the cotton frames, being simply adapted to the exigencies of flax. The hobbins are set at the back, the yarn running off through the watering tank (for wet spinning) placed between the bobbins & cylinders. As the yarn passes under the cylinder, the water is pressed out into a canal directly under the lower cylinders. The yarn then runs off perfectly dry to the reels, and owing to the long self-revolutions, a better and smoother yarn is the result. The new method not only decreases general expenses, but saves labor as well.

Facts About Pewter.

The recent fad for vessels and utensils of pewter has led many people to wonder what pewter really is. Pewter is one of the most ancient of materials, having been used in most countries of the Old World for at least two thousand years. It was the substitute for silver, and was to be found upon the tables of the well-to-do classes of the Middle Ages. Later it took the place of wooden dishes, platters and bowls in the homes of the peasantry, and it was in general use until superseded through the adoption of cheaper materials, such as China and earthenware. Like silver, fine pewter oxidizes slowly, but unlike copper and brass, its oxides are harmless.

Tin forms the greater part of pewter, the finest varieties, sometimes

called "tin and temper" being simply hardened by a small mixture of copper. Ordinary pewter is a mixture of tin and lead. The law of France restricts the percentage of the lead to 16.5 per cent, this mixture being claimed as proof against sour wine and vinegar. Britannia metal is really a pewter of good quality, containing tin, antimony and copper.

Pewter was manufactured by casting and hammering, the use of the lathe being limited by the laws of the craft guild. In early times the molds for casting belonged to the guild and were left to the members. From the nature of the material, the beauty of pewter depends chiefly upon its form of outline. It is too soft for the kinds of ornamentation produced by the chaser and engraver to be successfully used. Decoration by the latter method is usual, but it quickly shows signs of wear.

New Uses for Paper.

If you ask the average man what paper is made of, he would almost certainly say "rags," and so far as the finer qualities of note paper is concerned, this would be true; but for paper in general the answer would be utterly inadequate, for there exist in the whole world not one thousandth part of the rags that would be necessary to supply the great and growing consumption of paper. Our civilization, indeed, may be said to exist on a paper basis, and science has laid her hand on our forests, converting them into wood pulp and then into the required material. But there are many other sources from which paper can be made: for instance, from corn, barley, oats, rice, alfalfa and ramie; and what seems even more strange, from potatoes, beets, peas, beans, pine needles, sugar cane refuse, jute, moss, and the leaves and bark of trees. In many of these cases, however, the cost of manufacture is so high as to make the product commercially unavailable. These novel papers are prepared for special uses; and it will surprise most people to find to how many uses paper is now put. The wheels of our wagons, the rails on which cars run, cannon, shoes for horses, bicycles, asphalted tubes for gas or electric wires, are made of paper. Wood pulp combined with zinc sulphate, has been employed for artificial bricks. Subjected to heavy pressure and baked for 48 hours, it issues in the form of slabs which are employed for pavements, and are reported to render satisfactory service. Roofing tiles and water pipes are made in the same way. Coffins, barrels, vases and milk bottles are prepared of this material in Germany, and the Japanese would find life difficult without paper, as they employ it for clothing, for lanterns, for umbrellas, for handkerchiefs, for artificial leather, and even for portions of their dwellings. But perhaps the most novel use yet known is for telegraph poles. They are made of rolled sheets of paper, and are hollow, lighter than wood and so more easily handled, but are said to be durable and to show great power of resistance to the weather.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,
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Badge B. A. Richardson, Jr
 Fence post T. F. Jasper
 Mower casing. Lawn. 6 pats. M. E. Stanton
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Tubular structures. Apparatus for cleaning.....
..... A. H. Colloid
Turbine and muffler. Combination.....
..... G. E. Fulton
Turbine. Elastic fluid..... C. A. Backstrom
Turbine. Elastic fluid..... J. Wilkinson
Turbine. Fractional supply..... J. W. A. Eling
Turbine nozzle. Steam..... C. V. Kerr
Turn table..... C. W. Hillenbrand
Type writer adding attachment..... G. I. Wicks
Type writing machine..... J. Feibel
Type writing machine..... J. E. McCallahan
Type writing machine..... W. F. Heilmund
Type writing machine..... J. Feibel
Type writing machine ribbon guide.....
..... H. D. Bolton
Umbrella..... J. F. Martin
Umbrella. Folding..... C. H. Ely et al
Vacuum control system..... C. G. Patterson
Valve..... S. W. Miller
Valve. Automatic safety..... J. J. Heitz
Valve. Combined emergency and throttle.....
..... R. H. Rice
Valve for water gages. Safety..... W. S. Pitts et al
Valve. Gate..... T. Tromblee
Valve gear for pneumatic rock drills.....
..... C. Weidmann
Valve. Graduated release..... W. V. Turner
Valve mechanism for turbines..... O. Junggren
Valve. Pressure controlling..... C. E. Semple, Jr
Valve testing device. Triple..... C. C. Farmer
Vehicle..... D. O'Keefe
Vehicle brake..... T. L. & T. J. Sturtevant
Vehicle. Electrically propelled.....
..... R. Thayer et al
Vehicle. Motor..... W. D. Hawk
Vehicle seat..... L. Kuchenbecker
Vehicle wheel..... D. Ward
Vehicle wheel..... E. Keyser
Vehicle wheel..... V. E. Beauchemin
Vehicles. Spark coil box for motor..... R. Huff
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..... C. H. Lindecker
Velocipede..... Z. F. Carroll
Ventilator..... E. H. Caswell
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Voice placer..... R. D. Youngman
Voting machine..... N. B. Ross et al
Voting machine..... N. B. Ross et al
Voting machine. 2 pats..... W. M. Cutter et al
Wagon dump..... J. F. White
Wagon. Dumping..... M. J. Ely
Wall structure and building same. Retaining
..... W. P. Rice
Washing machine..... O. Harris
Washing machine..... J. Homier
Watchman's locking apparatus..... H. Hindersin
Waterbag, syringe and colonic irrigator.
Combined..... J. W. McDowell
Water control system..... A. J. Collar
Water heater..... H. G. Martin
Water purifying apparatus..... A. E. Dieterich
Water systems. Relief device for.....
..... L. W. Eggleston
Weeder..... W. R. Jenkins
Weeding tool..... J. R. Gilbert
Weighing and sacking machine. Automatic.....
..... J. H. Pennick
Weighing apparatus. Liquid..... W. H. George
Wheel mounting..... F. H. Richards
Whistle..... T. Hoeps, Jr
Winding machine tension device.....
..... J. O. McKean
Windmill regulator..... H. A. Kricke
Wire stretcher..... O. T. Shipp
Wire stretcher..... W. P. Chisholm
Wire stretcher..... J. F. Scott et al
Wire stretcher..... H. Waller
Wood ornamenting dies..... E. C. Dittmar
Wrapping machine. Package..... F. M. Peters et al
Wrench..... F. A. Garland

Wrench..... W. H. Dennison
Wrench..... D. E. Rowland
Wrench or spanner..... C. A. Hunton
Wringer. Folding..... H. G. Burrows

DESIGNS.

Casket name and handle plate..... F. K. Allen
Clock frame..... J. E. Steinmeier
Comb and brush rack. Combined.....
..... W. H. Moffitt
Gas burner. Inverted..... T. J. Little, Jr
Glass vessel..... W. S. Jones
Hammock..... I. E. Palmer
Heating and illuminating device. Combined
..... 2 pats..... S. S. Th. Hoer
Medal or similar article..... C. Osborne
Nail cap plate. 2 pats..... G. R. Wyman
Ribbon..... 5 pats..... H. Kamsler
Tea shelf..... G. F. Nolte

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Accounts. Means for keeping credit and in-
stallment..... I. H. Hollander
Aerial navigator. Automobile..... G. M. West
Air brake..... B. Canell
Air filter and cooler..... J. Zellweger
Amusement apparatus..... E. S. Mitchell
Amusement apparatus..... S. J. Hart
Amusement device..... A. Haye
Atomizer..... F. S. Dickerson
Atomizer and like instrument..... F. C. Dormont
Auger. Earth..... G. Frank
Automatic sprinkler..... J. H. Dixon
Automobile motors, &c. Lubricator for.....
..... J. F. McCanna
Awning sheave block..... W. G. Halkett
Bag frame..... C. Hering et al
Bag frame. Sewed-in or English..... J. Lange
Barbers' chairs. Sanitary protector for head-
rests for..... A. Miller
Barrel washing machine..... R. Troehler
Battery charging system..... W. I. Thomson
Bearing. Roller..... W. T. Fleming
Bed and guide attachment. Supplemental.....
..... A. F. Heckel
Bed bottom..... W. H. Donaldson et al
Bed spring raising device..... C. M. Schwab
Bed. Wall or closet folding..... C. Warnecke
Bedsteads. Collapsible crib attachment for.....
..... E. C. Smith
Beer and other liquids having gas dissolved
therein..... F. Knipping
Beer racking apparatus..... H. L. Momburg
Belt clamp..... G. H. Alexander
Belt guide..... M. E. De Gree et al
Belt stretcher..... S. L. Porter
Belting. Machine..... D. E. Jones
Binder. Temporary..... W. S. Mendenhall
Binder. Temporary..... F. J. Schleede
Binder. Temporary..... A. Lawrence
Bit brace. Angle..... J. H. Ackermann
Blower head. Rotary..... G. C. Hicks, Jr
Boiler cleaner..... C. H. Prescott
Boiler stand..... J. A. Gagnon
Book carrier..... J. W. Johnson
Book cover. Detachable..... P. Meissner
Books, &c. Apparatus for the automatic de-
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Bottle..... S. G. Wise
Bottle. Non-refillable..... A. G. Schweizer et al
Bottle soaking machine..... D. Wickham
Bowling pin setting device..... J. H. Boyd
Box framer or former..... A. Lasance
Box lid clamp..... G. Patterson et al
Brace and support..... E. E. Seacrist
Braiding and lace-making machine.....
..... H. J. Quambusch
Brake..... L. B. Williams
Brake shoes. Making..... W. D. Sargent
Brander. Electric..... G. J. Schneider
Bride..... H. A. Sievert
Broom protector..... J. C. Cooper
Brush. Sanitary hair..... R. J. Ellis
Brush. Scrubbing..... F. W. Scofield
Buckle. Cross line..... N. G. Wilson
Buggy top support..... L. W. Loving
Building block..... J. H. Clayton
Bivy. Breeches. 2 pats..... J. W. Dalton
Bustle..... F. B. Kuebler
Butcher's cleaver..... J. H. Sherry
Butter box..... G. E. Woodbury
Button cleaning machine..... C. G. Heller
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Buttons and like articles. Machine for turn-
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Camping lodge..... S. B. Comstock
Candelabrum..... A. C. Guntzer
Cane. Extracting saccharine matter from
sugar..... M. R. Spelman
Car. Box..... W. H. Emerick et al
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Car brake beam. Railway and other.....
..... S. A. Crone
Car brake. Railway. 3 pats..... S. A. Crone
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Car construction..... S. M. Curwen
Cardoor. Grain..... T. F. Mitchell et al
Car draft rigging. Railway..... F. L. Englehardt
Car draft rigging. Railway..... 2 pats..... W. H. Miner
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Car rail standard..... J. H. Nantz
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..... C. W. Ryder et al
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Car ventilator..... A. P. Scheurman
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Cars. Antifriction center-bearing for railway
..... J. F. O'Connor
Cars, &c. Means for elevating..... A. V. Trust
Carbureter..... J. M. Kelley
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Carpet cleaning device..... C. W. E. Biegel
Carpet sweeper..... L. P. Halladay
Cartidge..... F. I. De Pont
Cash register..... W. F. Backhoff
Casting machine. Matrix..... J. R. Rogers
Cellulose threads. Manufacture of lustrous.....
..... R. Linkmeyer
Cement. Roofing..... M. W. Powell

- Chafe iron C. T. McClelland
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Chuck. Drill P. McKay
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Cigar banding machine. 2 pats. J. King, Sr.
Circuit breaker. Time limit W. M. Scott
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Clock. Electric alarm L. Trede
Clutch. Electromagnetic friction W. Schuster et al
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Concrete building blocks. Machine for manufacturing hollow. reissne. F. A. Borst et al
Concrete construction W. T. McCarthy
Concrete post mold W. J. Moore
Conduit box. Interior F. W. Erickson
Connecting ring F. H. Engeman
Conveyer C. D. Seeberger
Copy holder J. H. Sharp
Corrugating machine I. W. Numan
Coupling device H. Hillis
Crown. Porcelain and metallic. C. A. Davis
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Current heater. Alternating. J. F. McElroy
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Curtain fixture R. R. Lawson et al
Curtain pole J. F. Lalus
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Desk pad and clip for holding papers. Combination M. Vernon
Detector bar J. T. Hambay
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Door lock J. Major
Door register and alarm J. Speidier
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Drilling machine A. Walker
Drilling machine crank J. H. Engleman
Dust collector P. C. Miller
Dust guard G. F. Godley
Dynamos. Automatic regulator for direct current G. S. Neeley
Dynamos. Automatic voltage regulator for G. S. Neeley
Easel frame S. Bodinger
Edge setter iron with stitch wheel M. F. Lindberg
Educational device G. W. Campman
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Electric contact device P. O. Pedersen
Electric furnace. Pyro F. E. Roach
Electric generators. Regulating the field density of G. S. Neeley
Electric heater. Plural coil J. F. McElroy
Electric machine. Dynamo B. A. Behrend
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Electric transmission of intelligence I. Kitee
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Electrical receptacle B. E. Salisbury
Electroplating W. S. Hutchinson
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Elevator G. F. Steedman
Elevator car safety apparatus H. H. Busch
Elevator safety device C. H. Lemingwell
Engine J. H. Trevorrow
Engraving machine. Pantographic J. W. Lewis
Envelope and box. Safety W. H. Dobson et al
Envelope opener J. Rindberg
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Excavator dippers. Ejector for C. Strom
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Fence post P. E. Smith
Fence splice. Wire W. Clement
Fermentation of liquids G. Johnson et al
Fermenting apparatus. Wort. H. A. Schalk
Fertilizer distributor E. L. Hahn
File case A. Dixon
Finger nail trimmer J. H. Smith
Fire escape. Portable A. S. Olney
Fire extinguisher. Chemical. E. D. Matteson
Fire extinguishing apparatus S. A. Collins
Fire resistive construction B. E. Loomis
Fireproof building construction C. Collins
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Fishing reel S. Sykes
Furnace A. Box
Furnace grate D. J. McKenzie
Furnace mouth lining for boilers B. B. Lamprey
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Gage G. B. Westburg
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Garment clasp M. Rubin
Garment hanger A. W. Bernard
Garment hanger support G. H. Wheary
Garment supporter E. M. Silberman
Garter R. Gorton
Gas burner A. J. Quinlan
Gas. Device for regulating the quality of C. Matthews, Jr.
Gas heater E. G. Van Zandt
Gas lighting attachment W. B. Carrick
Gas producer W. H. Bradley
Gasoline engine J. Walsh et al
Gas washing and scrubbing apparatus S. Hersey
Gear case B. L. Waters
Gin saw cleaner R. L. Henderson
Glass gathering machine R. D. Brown
Glass pressing apparatus L. N. Loveland
Glass roofs and glass walls. U-bar for J. Degenhardt
Glass tiles. Manufacture of W. T. Nicholls
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Glove I. J. Bradshaw et al
Glove. Base ball J. H. Gassaway
Gline or sizing M. R. Isaacs
Gold dredgers. Separating cylinder for R. H. Postlethwaite
Governor for fluid pressure engines W. H. Larkin, Jr.
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Grader. Road J. W. Langfitt
Grain drill hopper F. J. & W. F. Genet
Grapple H. Roberts
Grate bar R. H. C. Roller
Grinding machine H. Lutter et al
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Grip J. R. Crabill
Gymnasium apparatus, &c. Rope connection for M. B. Reach
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Harvester bundle carriers. Automatic trip mechanism for T. Thompson
Hatchet K. K. Kihlmark
Hay rack and brake. Combined wagon S. F. Hughes
Head motion A. Guionneau
Heat transferring apparatus H. R. Tracy
Heating device. Structure D. W. Kreiwitz
Heating surfaces. Machine for G. H. Lutz
Heating system A. G. Paul
Hinge H. I. Nagle
Hinge and closer. Door W. K. Henry
Hinge washer J. F. George
Hitching bolt G. Rheingans
Hoist J. R. Sharp
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Hose bracket. Swinging L. T. Foreman
Hot air furnace T. G. Neal
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Hydraulic power systems. Means for effecting and controlling the storage of water in F. Golwig
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Insulators. Die for forming F. M. Locke
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Measuring device. Foot F. L. Kerr
Measuring vessel. Liquid R. C. Ricketts
Meat hook D. L. Walls
Metal cutting machine G. H. White
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Mirror holder. Adjustable S. E. Crane
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Molding machine N. Baldwin
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Mop holder J. Larson
Mortising and boring machine J. S. Waugh
Motor A. Charbonneau
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Pole. Telescopic H. H. Bremer
Porous hearth furnace J. E. Greenawalt
Postal card E. M. Miner
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Railway tracks. Composite metal and wood tie for. 2 pats. J. F. O'Connor
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Resilient wheel T. Oldfield et al
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Rotary kiln W. R. Warren
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Safety trip J. W. Gray
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Saw handle T. A. Smith
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Saws. Straight edge for circular B. Lafeur
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Sectional boiler A. Hage
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Shoe polishing stand W. O. Beck
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Signals. Receiving system for wireless transmission of V. Pontsen
Signal device J. S. Cunningham
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Silver cleaning compound W. H. Roome
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Skiing machine D. N. Robertson
Sled C. A. Lang
Snice. Free roller F. W. S. Stokes
Smoke consumer C. H. Shepler
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Spark producing device F. A. Thurston
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Steel. Producing a black oxid on the surface of E. Jablowsky
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Stick pocket C. G. Holz
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Stone crusher W. L. Veltin
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Telephones. Attachment for acoustics permitting use of ordinary K. M. Turner
Telephones. Automatic call indicator for E. P. Denton et al
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Telescope. Variable power G. N. Saegmuller
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Thill coupling C. C. Bradley
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Tobacco pipes. Wind guard for R. K. Sinclair
Tongue tip. Vehicle J. Larson
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Valve. Automatic relief E. B. May
Valve. Cylinder drain F. Armstrong
Valve. Flush W. A. Lanckton
Valve. Gate L. D. Castle
Valve gear G. A. Anderson
Valve gear for engines O. R. Harris
Valve guard F. W. Feisberg
Valve. Throttle R. J. Miner
Vapor rectifier A. Churchward
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Vibrator E. B. Jacobsen
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Voting machine J. A. Arment
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Water box F. Weston
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Window A. Kent
Window glass fastener J. A. Douglas
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Wire or bands of iron or steel. Manufacturing flat F. Forsberg
Wire stretcher R. A. Bradshaw
Wire terminal F. T. Lockwood
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Wool washing machine J. D. Hunter
Wrench W. Edwards
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Badge H. J. Hagerling
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Button. Lapel A. Johnson

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Clock case..... A. A. Newman
Drain tray..... S. V. Erdt
Emblem..... C. Flora
Game board..... H. A. Wood
Plate or similar article..... G. A. Alexander
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Beds. Head rest for..... J. S. Visger
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Book. Land reference..... A. B. Mitchell et al
Book stand..... R. G. Tuttle
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Building construction..... P. H. Jackson
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Burner..... A. B. Clunies
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Car curtain. Vestibule..... W. H. Forsyth
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Car. Dumping..... S. F. Swanson
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Carstep. Extension..... E. T. Wade
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Chimney cowl..... P. E. Lorenzen
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Churn..... R. T. Simmons
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Clepsis..... W. G., W. B., & J. L. Powell
Clock..... P. G. Giroud
Clock. Electric..... H. Iverson
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Clothes line fastener and stretcher..... H. B. Norton
Clothes line. Metallic..... J. W. Montgomery
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Clutches. Clutch band for friction C. J. Jager
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Cock. Cylinder..... E. H. Oberton
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Cores. Device for applying paste to..... A. Gloor
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Cotton gin..... J. W. Graves
Couch..... F. J. Cronch
Creaming can..... H. A. Arvig
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Cultivator..... H. Anderson
Cultivator attachment..... W. E. Wright
Cultivator attachment..... G. L. Bates
Cultivator weeding attachment..... H. R. Nelson
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Current motor. Alternating..... M. Mich
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Dish..... W. F. Donovan
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Display case..... R. Turner, Jr
Distributing machine. Manual..... H. W. Blaisdell
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Door opener and closer. Automatic..... K. Nishimoto
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Draft rigging. Friction..... O. S. Pulliam
Drawing board..... E. K. Reichenbach
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Dress form..... P. A. Smith
Drill..... H. A. Eastman
Drum trap..... R. Wensley, Jr
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Dye and making same. Black mordant..... A. L. Laska
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Electric cut out switch..... P. Peters
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Electrical indicating device..... G. Zapf
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Elevator conveyer for store and office service. Automatic discharging..... W. H. German
Elevator door operating apparatus..... F. S. Payne
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Embalming table..... S. A. Harper, Jr
Embroidering machine shuttles. Apparatus for filling..... E. Berger
Embroidery. Hand made..... N. Friedberger
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Engine regulating apparatus..... A. C. E. Rateau
Engine stop. Automatic..... H. M. Martyn
Engineer's alarm..... E. McClintock
Expansion bolt..... D. W. Bennett
Explosive..... C. E. Bichel
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Fan. Ventilating..... L. L. Holladay
Fare register and recorder..... W. I. Ohmer et al
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Fence..... C. A. Brinley
Fence making tool. Combined..... W. S. Guinter
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Fence post molding machine..... M. C. Munn
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Filter..... A. E. Krause
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Fluid mixing apparatus..... S. Manning
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Pen. Marking..... G. W. Lovering
Pens, &c. Holder for fountain..... D. W. Beaumel
Permutation lock..... A. J. Stolt
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Photographic film package..... I. de Castele
Photographic shutter..... 2 pats. R. Klein
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Piano pedal extension. Adjustable..... J. R. Drew
Piano players. Music sheet mechanism for..... J. J. Healy
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Piano. Self playing..... E. J. Knabe, Jr
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Pole for electric wires and other purposes. Composite..... E. M. Johnson
Polyphase motor. Variable speed..... R. D. Mershon
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Power transmission apparatus..... W. L. R. Emmet
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Printing and delivering machine. Ticket
Printing press ink distributor.
Propelling row boats. Means for.
Pulley.
Pulley. Automatic release.
Pump.
Punch for metal.
Punch. Ticket.
Purse. Change.
Puzzle.
Radiator.
Rail brace.
Rail braces. Means for manufacturing composite.
Rail joint.
Rail joint.
Rail joint.
Rail support.
Rail tie and fastener.
Rails. Anticreeping device for.
Railway.
Railway cattle guard.
Railway construction.
Railway crossings. Automatic safety alarm apparatus for.
Railway rail tie plate and brace.
Railway signal.
Railway signaling system.
Railway switch.
Railway switch operating mechanism.
Railway tie. Composite.
Railway track construction.
Razor. Safety.
Receptacle and closure for same.
Refrigerating apparatus.
Rein holder.
Reverse switch. Automatic electric.
Rheostat.
Rivet driving machine.
Road making machine.
Rock drill.
Rocking device.
Rolling mill feeding device.
Rotary engine.
Rotary gas engine.
Rule attachment.
Safety appliance.
Sand blast mechanism.
Sand blast nozzle.
Sash fastener.
Saw.
Saw frame.
Sawmill carriage.
Scale. Computing.
Scale plate.
Scarf or necktie pin holder.
Scissors cutting gage.
Screw driver.
Sewage, &c. Apparatus for separation of solid matters from.
Sewing implement.
Sewing machine presser foot.
Shaft. Flexible.
Sharpening machine. Razor.
Sheet metal construction.
Sheet metal cutting machine.
Ships, warehouses, &c. Apparatus for the treatment of cargoes and goods in.
Shoe polish box.
Show case.
Shutter bower.
Shutter fastener.
Sifter. Ash.
Sign apparatus. Electric.
Signal systems. Protective device for.
Signaling apparatus and circuit. Electric.
Slicer. Vegetable.
Slimes, sands, &c. Continuous filter for.
Smelting furnace. Zinc.
Smelting iron ores.
Smoke consumer.
Soap and towel rack.
Soap dispensing apparatus.
Soldering iron.
Spark arrester.
Specialist's chair.
Speed device.
Spindles. Bobbin holder for spinning.
Spittoon.
Spring motor.
Spring wheel.
Square. Combination.
Station indicating system. Electrical.
Steam boiler.
Steam eliminator.
Steam engine.
Steam regenerative accumulator.
Stone and other material. Tool for working.
Stone. Combination for and the process of manufacturing artificial.
Storage battery.
Storage battery.
Storm and screen construction.
Stove.
Stove draft apparatus.
Stove. Heating.
Stove. Heating.
Stovepipe brace.
Stovepipe joint. Adjustable.
Stovepipe joint and coupling. Compensating.
Stump extractor.
Substation protector. Weatherproof.
Sucker rod elevator.
Suction box.
Surgical needle support.
Surveying instruments. Lateral adjuster for.
Suspenders.
Sweep or wreck finder.
Swimming machine.

Switch interlocking mechanism.
Switch stand and connection therefor.
Synchronizing apparatus.
Tablet making machine.
Tank and supporting structure therefor.
Tanning hides.
Tanning hides, skins, and the like.
Tap.
Telegraphy and telephony. Composite system of.
Telephone call index.
Telephone direction plate.
Telephone exchange for double wire telephone systems. Automatic.
Thawing point.
Theodolite.
Thermostat. Electric.
Thermostat for journal bearings, &c.
Thimble attachment.
Thread lubricating device.
Three point jack.
Ticket delivering machine.
Tile machine.
Time recorder.
Tire. Vehicle.
Tire. Vehicle.
Tire. Vehicle.
Tire. Vehicle.
Tires of vehicles. Device for inflating the pneumatic.
Tires to motor car and like wheel rims. Means for securing flexible.
Tobacco container.
Tobacco pipe.
Tongue. Vehicle.
Tool. Combination.
Tool. Combination.
Tool. Hand controlled.
Tool. Pneumatic.
Tool testing apparatus. Pneumatic.
Tools. Conductor support for movable.
Torpedo. Automobile.
Torpedo steering apparatus. Automobile.
Toy.
Toy.
Toy.
Toy. Transformation.
Toy wagon.
Traction engine.
Train signal.
Train ventilating apparatus.
Tree felling apparatus.
Tree felling apparatus. Large.
Trellis.
Trolley pole head.
Truck. Car.
Truck. Car.
Truck. Car.
Truck. Railway car.
Truck side frame. Car.
Trunk folding.
Tubing.
Turbine.
Turbine bucket wheel. 2 pats.
Turbine. Multistage.
Tying a slip noose. Machine for.
Type justifying machine.
Type writer stop device.
Type writer tabulator.
Type writing machine.
Type writing machine.
Type writing machine.
Umbrella.
Umbrella. Folding.
Underreamer.
Universal joint for transmission gears.
Vacuum breaker.
Value. Cylinder relief.
Valve. Float.
Vehicle bodies. Controlling devices or spring supported.
Vehicle brake.
Vehicle elevator.
Vehicle. Road.
Vehicle wheel.
Vehicles. Speed and distance indicator for.
Vending machine.
Vending machine. Cigar.
Vending machine. Newspaper.
Veneer machine.
Veneer rolls. Wood core for.
Ventilator.
Vessels. Course and bearing finder for.
Wagon attachment.
Wagon running gear.
Wall cleaning compound.
Walls, &c. Machine for molding A. J. Stoesser Watergate.
Watergate.
Water heater.
Water heater.
Water heater.
Water meter.
Water seal trad.
Water or fluid gaging tube.
Water transportation means.
Watering trough.
Wave propelled motor.
Weather strip.
Weather strip.
Wedge cutting machine.
Weeder tooth.
Weighing and feeding device.
Weighing machine.
Well machine.
Wells. Apparatus for igniting primers in.
Wells. Rod adjuster for pumping J. A. Stoops Wheat heater.
Wheel.
Wheels upon axles. Device for holding.
Whiffletree hook.
Winding core.
Winding fabrics, threads or yarns. Automatic regulator for use in.
Window.

Window mechanism.
Window screen.
Window screen.
Wire cutting machine.
Wire straining apparatus.
Wire supporting arm.
Wire tension and measuring device.
Wood and producing the same. Treated.
Wood. Changing.
Wood. Extracting products from resinous.
Woodworking machine.
Wrench.
Wrench.
Wrench.
Writer's hand support.
Writing case. Pocket.
Yoke and hose supporter. Combined.

DESIGNS.

Bed quilt.
Bottle.
Bracelet.
Casket trimming.
Coat and hat rack.
Fob plate.
Fork or spoon or similar article.
Post card.
Sugartongs.

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Novel Steam Motor Car.

Almost every day brings the announcement of a new pattern of railway car, so that it would seem that no two are now made alike. Probably the frequent appearance of new ideas means that the evolution of the passenger vehicle is not yet finished, and before perfection is attained, many more changes in design, power, equipment, etc., may be expected.

Many new features, among which are the use of oil as fuel, and the employment of superheated steam, are embodied in a motor car which is now being tried on one of the branch lines of the Canadian Pacific railway. It resembles a combination passenger and baggage car, and its special feature lies in the boiler, which is of the marine return-tubular type with a

single Morison corrugated furnace. The Canadian railway company is strongly in favor of the use of superheaters on locomotives, and the new car is fitted with a superheater having 21 steel tubes an inch and a quarter in diameter. This is of such capacity that when the steam reaches the valve chest, it has a temperature of 700 to 760 F.

The fuel used is crude oil and it is fed to the furnace by a slot burner of the Booth type, the supply cock and blower being controlled by an automatic device. This oil is carried in a tank of 2,000 pounds capacity, which is built in the frames of the driving truck and in which an air pressure of 15 pounds is constantly maintained. The boiler is also fitted with a sand blowing device for cleaning soot out of the tubes. For the boiler feed, there are two injectors, and the water supply is carried in tanks secured to the underframe of the car body. These total capacity is 1,080 gallons.

The driving truck has frames of seven-eighths-inch steel plate and has outside cylinders placed at the rear end of the frames, driving the front axle. The wheels are not coupled. Single-bar girders are used, placed above the piston rods, and the connecting rods are in one section. The pistons are of cast iron three inches thick, and the wheels have cast steel centers.

Owing to the position of the fuel tank between the frames and the limited space available inside the wheels, outside valve gear is used, operating piston valves of the inside admission type. The car is equipped with the automatic brake system, especially adapted to this class of service.

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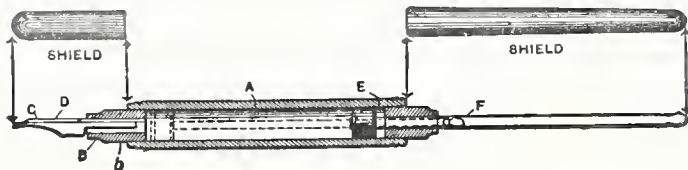
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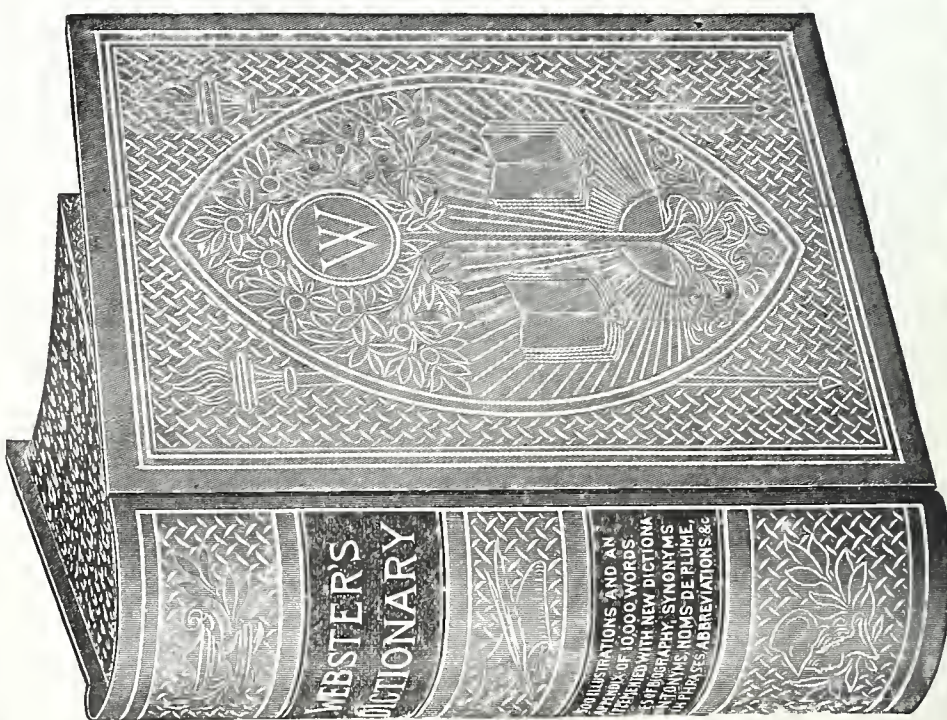


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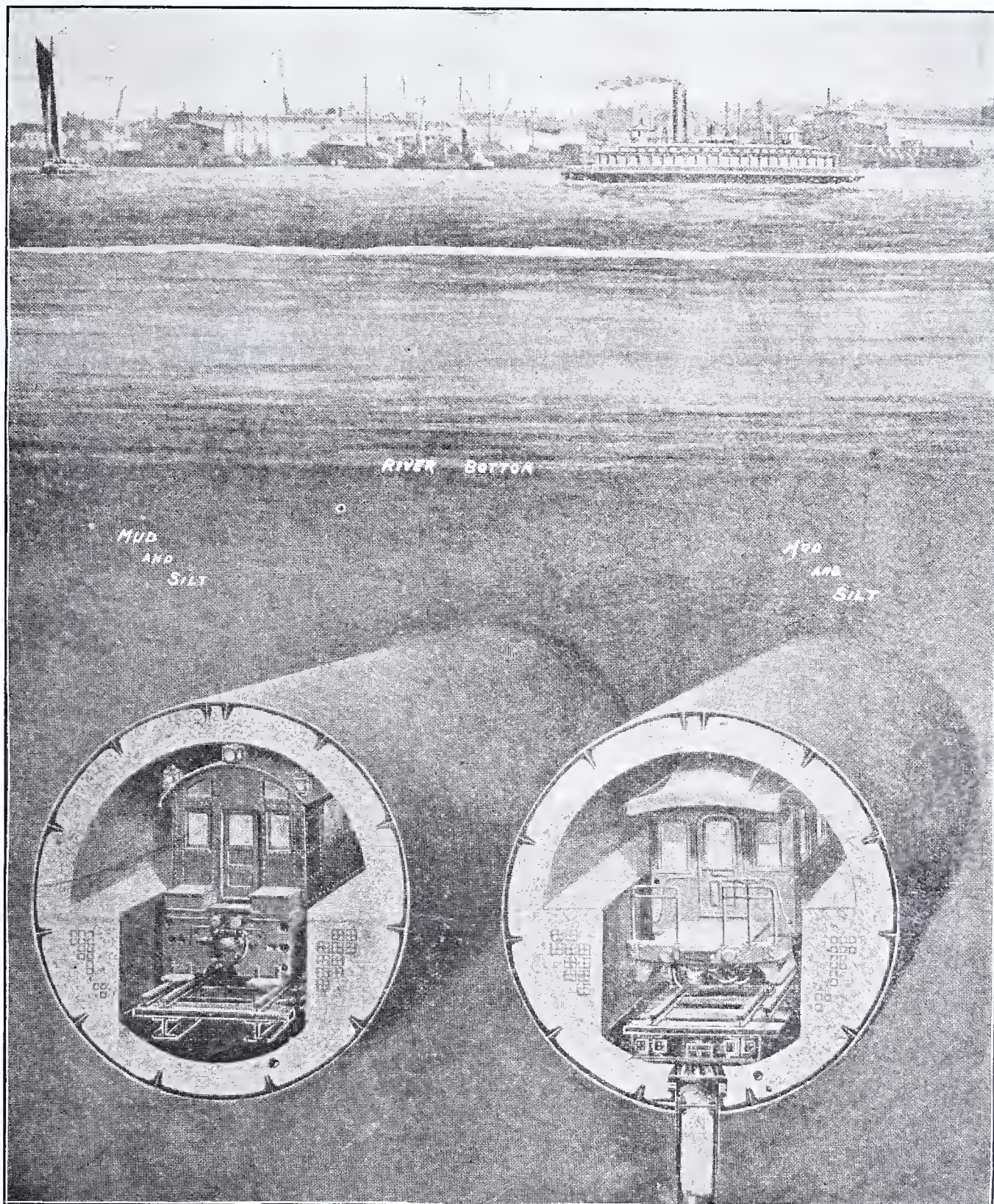
NINETEENTH YEAR.
No. 2.

WASHINGTON, D. C.—FEBRUARY, 1907.

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THE ROMANCE OF TUNNEL BUILDING.

THE element of danger that always lends romance to an undertaking is conspicuously present in the work of digging tunnels, especially those beneath water. Few people appreciate the extent of the subaqueous work that is going on around Manhattan. When completed, there will be sixteen miles of tunnels under the waters in the vicinity of New York—an engineering feat truly cyclopean in conception and execution. The Rapid Transit Commission is pushing two tubes across to Brooklyn from the Battery. These were the first East River tunnels to be started, and one tube is now practically done, while the other will soon follow. They are over 7,000 feet long, and have an inside diameter of fifteen and one half feet. The Pennsylvania company is constructing four tubes to Long Island City, which will be 6,000 feet long and have an inside diameter of 19 feet. The Belmont tunnels, as they are usually called, which will be used to connect the trolley system of Queens County, owned by Mr. Belmont, with New York, are also four in number. Other tubes extend under the Hudson from railway terminals in Hoboken, and continue through new subways to a terminal at 32nd street. The Hudson Company is constructing two more tubes which will strike Jersey City at the present Pennsylvania Railway terminal. Finally must be mentioned the tubes that are part of the "New York Im-



TUNNELS UNDER THE HUDSON.

provement" scheme, which will extend from Harrison, N. J., to Long Island City—under two rivers, a range of hills and an island. When all the

bores are completed, there will be traffic facilities six tiers deep in the metropolis—beginning with the foot-bridge for crossing the elevated tracks,

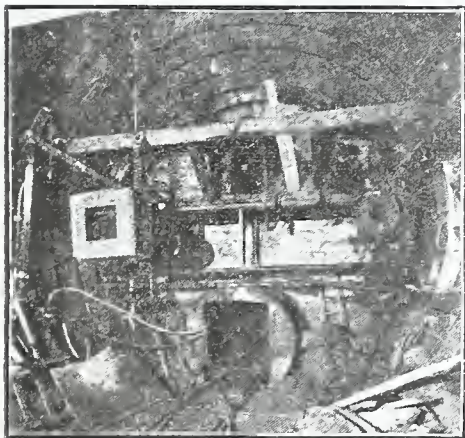
and descending by way of the elevated railway to the surface lines, to the underground route of the New York & New Jersey R. R. Co., to the Rapid Transit subway, and to the Pennsylvania Railroad tunnel, which will be underneath all.

In subaqueous tunneling, air pressure within the tunnel of sufficient power to offset the pressure of silt and water at the heading is necessary. The increase of pressure required above that of the atmosphere is about one pound per square inch for every two feet of depth. With a small tunnel the difference of pressure required between the top and bottom of the tunnel is slight, but with such tunnels as have been described, this difference becomes important. As the air pressure at the top of a tunnel heading of 23 feet diameter is some 10 or 12 pounds greater than is needed to counterbalance the inward pressure of sand or silt at that point, there is a constant seepage of compressed air through the river bed. This tends to loosen the material of which the bed is composed, and if the silt is not thick or solid enough, a blowout follows, whereby a hole is made in the bed of the river and the tunnel is liable to be flooded. To remedy this, clay is dumped on the bed of the river, to strengthen it and fill the hole, besides increasing the depth

of earth above the tunnel roof. In the tunnels being dug by the Pennsylvania Company under East River, a number of these blowouts

have occurred. Some have resulted in loss of life, but in one spectacular case, a man was blown through the earth and the body of the river into the air, was picked up by a boat, and was able to report again for duty at once. Tunneling under the East River presents many of the most difficult features ever experienced in subaqueous boring. Not only is rock met with at various points throughout almost the entire course of the work, but there are sand, gravel, and worst of all, quicksand. The Hudson River tunnel, too, was long considered an impossibility. The first attempt of this nature was begun as far back as 1874, but after twenty workmen had been drowned, the "rathole in the river" was abandoned. Subsequent efforts proved likewise unsuccessful, until finally, in 1902, work was begun again with new methods, and man triumphed over the river.

The most mysterious thing to the layman is how a tunnel can be driven from opposite sides of a mountain, or from opposite shores of a river, and made to meet in the middle. An engineer will say that it is only a problem in trigonometry. For every section of the tunnel a new survey is made, and the results in the approaching headings compared. If the comparisons show an error, the course is changed. When the tunnel ends approach within a few feet of each other, a pipe is sometimes driven from one to the other. Through this it is possible to sight and thus check the surveys by an actual observation. If any mistake has been made, it is corrected to the thousandth of an inch.



A SHIELD FROM THE INSIDE.

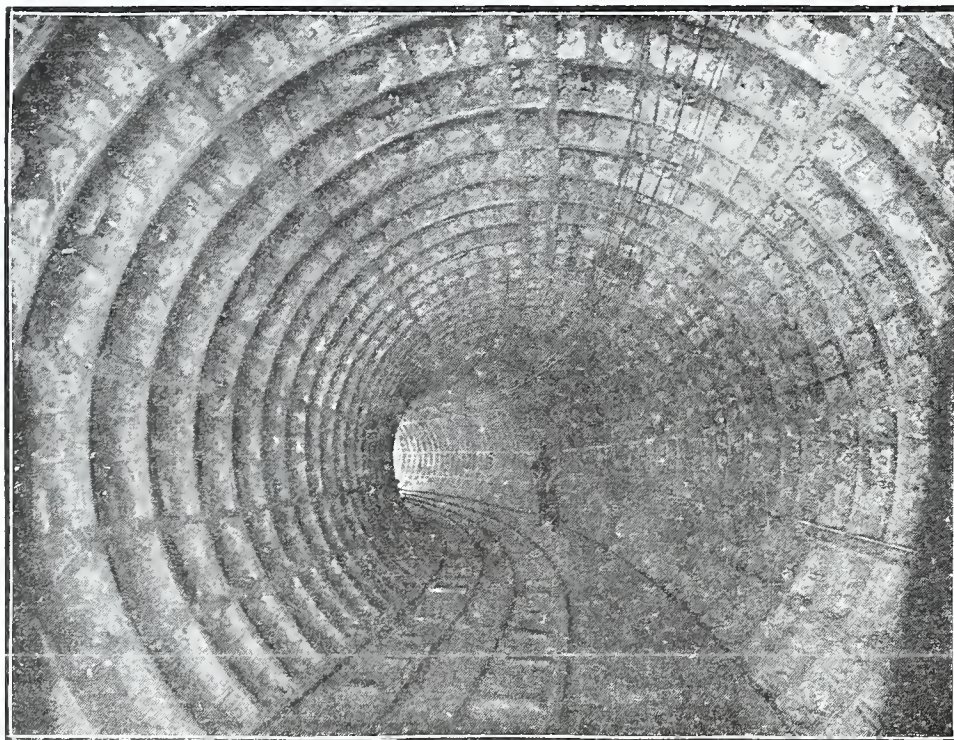
The crucial point in tunnel building is the shield. (See illustration.) It is like the cover that fits over a tin canister. It caps the advancing end of the tunnel with its face and a shell that extends back several feet over the completed tunnel wall. Inside this hood the tunnel is constructed in rings composed of a number of segments with inwardly projecting flanges which permit them to be firmly bolted together. When finished, the tunnel is usually lined with concrete, making a perfectly smooth wall. On each side is a shelf for wires and pipelines; there is also a footpath at about the height of the car windows, for use should trains be stalled. (See illustration.)

The shield is pushed ahead by a circle of hydraulic jacks extending from the diaphragm of the shield and braced against the circumference formed by the flanges of the last completed ring of the tunnel. As the jacks

shove the shield ahead the width of a ring, the shell slides over the outside surface of the tunnel wall and the segments that make a complete ring are erected inside it. So the tunnel grows ring by ring.

The segments are too heavy to be held in place by the workers until bolted. This problem has been solved by the "erector," a device rotating about the centre of the tail of the shield, which picks up a segment weighing several hundred pounds, carries it to the proper place, and holds it there until it is bolted.

Modern subaqueous tunneling would be impossible without the use of compressed air; and yet this valuable agent has drawbacks and perils. In



A COMPLETED SECTION OF A TUNNEL.

the plant used for the Pennsylvania tunnels are seven huge air compressors, capable of pumping 44,000 cubic feet of air into the tunnels every minute. The shore end of the bore is closed by an air-lock—a cylinder of some 6 feet in diameter, built through the wall that seals the end of the tunnel. At each end of the lock is a door. That leading to the outer air can be opened only when the one leading into the tunnel is closed and the air pressure in the lock the same as that of the ordinary atmosphere. A man, to work in compressed air, must be sound in heart, lungs and throat. Even then the laborers suffer from caisson disease, or the "bends"—so called because the sufferer is bent double with pain. It is caused by air bubbles getting into the blood, as a result of coming out of high air pressure too rapidly, and the treatment is to place the patient in an air tight compartment and reduce the pressure gradually until the bubbles get out of the system.

Working in compressed air is not pleasant. On entering the air lock and beginning to breathe the new atmosphere, there is a painful pressure on the drums of the ears; it is necessary to shout to make oneself heard, and it is so hot that the body is bathed in perspiration. It is impossible to whistle. The men work three hours at a time, and some of the expert laborers have been in the business for fifteen years.

As already stated, where the river bed grows thin, clay is dumped on it to obtain a thickness of 20 feet or so. In the Pennsylvania tunnels this clay has been removed as the tunnels advance and dumped farther out. It will be seen that this is a laborious and slow method. The company is now experimenting with a new system which consists in freezing the silt. A small pilot tunnel is first driven and a series of pipes installed which contain brine from a refrigerating plant. These serve to freeze the moist material around the tunnel a sufficient distance to allow of enlarging the smaller tunnel in the frozen silt. A temperature of about 35 degrees below zero has been maintained in the bore

for some months, with the object of freezing the sand to a radial distance of about 14 feet. It is desired to obtain a frozen cylinder 35 feet in diameter, or 12 feet larger than the completed tunnel. This ring of frozen earth six feet thick will sustain the pressure of earth and water around the larger tunnel while the plating is being placed. By removing the plates of the small tunnel and digging out the frozen material, the enlargement of the bore can thus be accomplished without the use of compressed air or the danger of blowouts. The pilot tunnel can be driven in half the time required for the full sized one, and as all delays from blowouts would be avoided, it seems probable that a gain might be made in the time required for construction, as well as in the cost of building.

Bells in the Ocean.

The boy who has gone swimming knows how much louder a couple of stones struck together under the water when he dived, sounded than when struck in the open air. The principle is being used to protect ships from rocks and reefs on the coasts. Bells are suspended in the water some 25 feet under the surface and are rung by electric apparatus from the shore or are connected with wave-operated buoys. In the ship's hold a telephonic contrivance receives the sound of the bells, which in rough weather can be heard 4 to 12 miles away; so much better does water transmit the sound vibrations than air.

"BUSINESS OPPORTUNITY" FAKES.

City Swindlers Who Pretend to Control Capital.

From Bench and Bar

Lawyers everywhere should warn and protect their clients and acquaintances against the depredations of a class of unprincipled promoters and so-called "business opportunity" financiers who operate somewhat extensively in New York city and less important financial centers. These are they who pretend to possess or be able to control unlimited capital for the establishment or development of "sound" commercial or industrial enterprises, but who in reality subsist on advance fees and an unsuspected share in the charges of experts, accountants, auditors, and even disreputable members of the bar, with whom the business opportunity shark is too often in league. The capital, of course, is never furnished.

If the "come on" appears to be an easy mark, very enthusiastic about his project, or betrays the possession of a handy balance in pocketbook or bank, an advance charge is generally made by the "broker," to be deducted, of course, from his commissions "when the deal goes through." This payment is required, it is affably explained, just as an evidence of the applicant's good faith, or as proof of his confidence in his enterprise, or to defray initial expenses of some sort or other—anything that is creditable or even swallowable under the circumstances.

Then begin charges for audits and examinations by "experts," as exorbitant as the subject, who by this time has probably told everything about himself and his affairs, can stand—for, of course, it is explained, both the broker and his yet invisible capitalist require an investigation by persons of their own nomination, in whose judgement and opinion they have "confidence." The greater part of the fees paid for such services comes, of course, swiftly and surely into the pocket of the clever business broker, generally followed by an apparently satisfactory report upon the property or proposition.

The next step is probably to suggest the incorporation of a company, if the applicant has not incorporated, or to propose a bond issue if he has, or the consolidation of two or more companies if several are involved, or a fabulous increase of capital stock—anything that requires the services of a lawyer. Here again the broker naturally nominates his own attorney, a liberal fee is paid in advance by the victim and divided between the conspirators as soon as the check can be rushed to the bank. After everything that the avarice and ingenuity of the "business broker" can devise has been done to separate the seeker after capital from what little ready money he has, the capitalist, who either has not materialized to the victim or has been impersonated by a dummy, loses his money in Wall street, dies, changes his mind, or something else most unfortunately and unexpectedly happens to prevent the final consummation of the deal. The broker pretends to be heartbroken. The victim is literally broken, in purse as well as in spirit.

THE PATENT SITUATION.

By B. G. FOSTER.

THE patent situation during the past year has, to state it briefly, gone from bad to worse. In considering this statement, however, the distinction between "inventions" and "patents" must be kept clearly in mind, for never before in the history of this country, nor for that matter in the history of the world, has there been such a wealth of inventive genius displayed, such wonderful achievements and so many apparently insurmountable obstacles overcome. And it is this same wonderful development in the world of invention that is partly the cause of the present condition in the patent situation.

To completely comprehend this, it is necessary to look into the history of patent grants. Originally they were merely matters of royal favor, and, for example, in England, up to within a short time, any one applying was granted a patent without an examination as to whether or not the invention was old. It will be evident that such practice was no particular incentive to inventors, for a wealthy manufacturer could readily make application and secure a patent on a meritorious invention already patented by some poor inventor, and, through the latter's inability to protect his rights because of the expense of litigation, the manufacturer could ignore such rights. It was this country that hit upon the proper theory of patents by causing examinations to be made in order to ascertain the novelty of an invention prior to the grant of the patent. With this warrant of the *prima facie* validity of a patent, an inventor can approach a manufacturer and treat with him on equal ground, knowing that if the latter should attempt to secure protection in his own name on the invention, he will be met with a rejection on the patent already granted. Thus the government to a certain extent is back of the patent, though, of course, if it can be shown that the invention covered thereby is old, the patent is invalid. This is the American practice, and is being adopted with some modifications by all the leading nations of the world. It is a practice that has established this country as the leader in all lines of mechanical activity, and is undoubtedly responsible, to a great extent, for the material wealth with which we are blessed.

As a result, the patent granting branch of the government has grown from a beginning wherein the president and cabinet personally passed on the merits of each invention, to a bureau of considerable magnitude presided over by a commissioner of patents and a corps of examiners, clerks and assistants. But this growth has entirely failed to keep pace with the rapid advance in the number of inventions, and as a consequence there is a vast accumulation of work, a lack of force to do it, and cramped and inadequate quarters, so that conditions in the Patent Office

have become intolerable. Every year adds thousands of patents, foreign and domestic, thousands of pamphlets, catalogues and literature concerning disclosures of devices not patented. These should all be digested, classified and examined before patents are granted; for it makes no difference where an anticipation is found—if an invention is not new, a patent should not be granted thereon. Under present conditions, therefore, a complete examination is impossible, and even making examinations as best the examiners can, the Patent Office is months behind in its work. The result is that the *prima facie* validity of patents must constantly and necessarily be sinking to a lower and lower plane, with a corresponding decrease in their *prima facie* value. Moreover, inventors are becoming discouraged, because of their inability to secure, within a reasonable time, the protection to which they are entitled under the law.

Another and very fruitful source of embarrassment to the Patent Office is its inability to obtain and retain competent assistants in the examining corps. The salaries vary from \$1,200 to \$1,800. Young men, college graduates usually, pass the required examination, and are appointed. They come in, absolutely ignorant of the first principles of patents, patent law or patent practice. Their knowledge, in so far as the work in the Patent Office is concerned, is practically nil. It requires several years to become experts in these matters, and become acquainted with the particular classes of invention which they are called upon to consider. This latter fact will be self-evident to any one having the most superficial knowledge of any involved art, as for instance, telephony, telegraphy, electric lighting in all its phases, or electrical generation, distribution and motive power. It requires as much time to become conversant with patent practice and patent law. The majority of these young men, however, have a comfortable income for their present needs, are learning patent matters and patent law in the daytime while at the office, and occupy their evenings with the study of law. Washington is well equipped in this respect, inasmuch as a number of law schools have evening sessions for the benefit of departmental employees. In three or four years these examiners become graduates in law, and having obtained sufficient knowledge in a particular art, besides having become more or less proficient in patent law, they resign, and become associated with, or employed by, patent attorneys, manufacturing corporations or the like, where the compensation is greater and the prospects brighter. The Patent Office then has to break in new and unskilled assistants in their places, resulting in still more confusion and greater arrearage. Thus the Patent Office is being employed to a great ex-

tent as a school, for which the public pays and for which it suffers. As instances of this, the personnel of one of the electrical divisions of the Patent Office has completely changed twice, with the exception of the principal, within the last four years, and in another electrical division there has been a resignation on an average of every two months for over a year. Moreover, there is a constant pressure for assignment to positions in these electrical divisions because of the chances for advantageous offers outside the office.

The fault, or rather the remedy, for these deplorable conditions unquestionably lies with Congress, which has heretofore been anything but liberal in its treatment of the Patent Office. While hundreds of millions are being spent on agriculture, on the army and on the navy, which bring in absolutely nothing from a material standpoint, the Patent Office, the only self-sustaining government institution in the country, is given barely enough money to keep it in existence, and is compelled to turn into the treasury every year whatever surplus it may have over its expenditures, which surplus usually amounts to about \$250,000. That this is not just will be evident to any one. The bureau of the government that has brought wealth and prosperity to this country should not thus be set aside. Nor can it be argued that hundreds of millions are given and spent by the department of agriculture and the army and navy because of their greater importance as instruments in the production of such wealth and prosperity, for the answer to such a statement is that without the American inventor the country's crops could never be raised and handled, its natural resources could not have been developed, nor could we have had the modern equipments of our army and navy in all their multitudinous details. It has been suggested that this glaring discrepancy in treatment is due to the fact that the Patent Office, in its very nature, is placed outside the pale of political activity; but whatever may be the real reason, it is clear that, for the welfare of the country, an office should be provided that is sufficient for all the needs, that a competent and adequate force should be employed to handle the work and that salaries should be paid which would insure the employment and retention of experts in the various lines of invention and in patent law and practice.

Music by Transmittograph.

In a Chicago summer garden during the last season the guests would hear music in the course of the evening that seemed to come from the trees overhead, the tune accompanying the band that was playing in the garden. Concealed in the trees were large megaphones, which were connected with wires running to a central station some distance away. At the station a cornetist who had a telephone receiver at his ear could hear the band playing in the garden, and he would play into an ordinary telephone receiver, which was in turn connected with the wires. These had at their ends megaphones, with highly sensitive receivers, and the result was that the music was magnified so that it could be heard all over the garden, with a novel and pleasing effect. The device is called the transmittograph.

STEEL CROSSTIES TRIED.

Pennsylvania Railroad Testing Sub-stitute for Wood.

The adoption of a steel crosstie filled with a mixture of asphalt and rock is the newest effort to fill the place of the old-fashioned wooden sleeper that has been in use so many years. The Pennsylvania railroad has decided to install 3,000 of these new ties just east of Lockport, on the Pittsburgh division of the main line.

It is becoming harder each year to get good wooden ties, with the result that the railroads of the country are casting about to find a substitute. Steel ties of two kinds are now being subjected to experiment by the Pennsylvania.

The newest tie is a steel casting with asphalt and rock filling. The steel facing extends only around three sides of the tie, the asphalt being exposed on the under side, which rests on the stone ballast. The size and shape are the same as those of a wooden tie, though the weight is about 700 pounds, or three times as great as that of a wooden sleeper. This great weight, with the asphalt surface resting on the ballast, is calculated to reduce "creeping" to a minimum.

A Dam on the Mississippi.

The latest in engineering projects is to turn the Mississippi into a mill stream. A ten million dollar dam is to be thrown across the river, furnishing a force which will generate 211,500 horsepower, or more than that supplied by Niagara Falls as at present utilized. The syndicate which backs this enterprise is said to represent \$30,000,000, and fifty thousand dollars have already been spent in preliminary surveys, etc. Not a few curious difficulties have been overcome in promoting this project: for instance, \$5,000,000 have been spent by the government in building a canal for navigation of the river past the rapids opposite Keokuk, Iowa. The new water power scheme will necessitate the overflowing of this great and expensive canal, and cause all the money and work to have been thrown away. Nevertheless, Congress was induced to look with favor on the undertaking, as the promise was made that as the works in the neighborhood were flooded, new ones would be constructed without cost to Uncle Sam, and that \$40,000 a year would ultimately be saved the government in the expense of operating the canal. It is expected that actual construction work on the dam will commence early this year.

Ordering Meals by Electricity.

The telautograph, an instrument that transmits writing by electricity over a wire, has never come into general use. The proprietor of a hotel in Cincinnati, however, has installed the apparatus for the convenience of his guests in giving orders. The guest, seated at his table, writes on a pad what he wants to eat, and a duplicate of the order at once appears in the kitchen. This insures the correct transmission of the message, besides saving time and labor.

CLEVER NEW PATENTS.

A Slung Shot.—Suspender Hook.—Toy Torpedo Exploder.—Rail-Joint.—An Improvement in Cockeyes.—Whistle.

A Slung Shot.

A slung shot or catapult of an exceedingly simple and effective character has been patented by Mr. Jewett B. Sweetser, of Danvers, Mass. The slung shot comprises a handle 1, a spring 2 that has straight portions in alignment with the handle, the outer end 3 of the spring being flattened.

A missile holder 4, is fitted on the flattened end of the spring, and has a cone-shaped socket 5 adapted to exert a slight friction upon a missile placed therein. A finger-piece 7 extends rearwardly from the missile holder, and has an enlarged rear end adapted to be grasped between the thumb and forefinger. Preferably the intermediate portion of the spring is coiled, though this is not absolutely necessary to the operation of the device. In using the catapult, the handle 1 is grasped in one hand, and the missile, such as, for instance, a marble or bullet, is placed in the cone-shaped socket 5; the finger-piece is then grasped between the thumb and fore-finger of the other hand, and the spring is flexed rearwardly to the desired extent, after which the finger-piece is released so as to permit the spring to throw the missile forward.

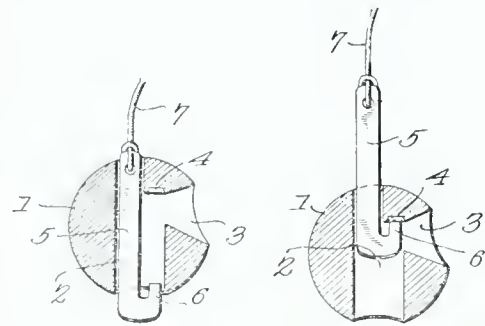
Suspender Hook.

A simple suspender hook designed for connecting suspender ends to trousers, though adaptable for use in other relations, has been patented by John Chism McRae, of Henderson, Mississippi.—The device comprises a frame or plate 10 that has at one end

The two pointed ends of the pin are arranged to be engaged by the guards 12 and 13. Extending from the plate 10 adjacent to the guards 12 and 13, are pointed spurs 17 and 18 that project toward the guards and extend at right angles to the outer face of the plate. It will be evident by an inspection of the accompanying illustration, that a strong, simply constructed, combined pin and suspension hook is produced, which may be quickly attached and securely fastened to the waistband of a pair of trousers or other similar garments, in a position for its hook 11 to be engaged by a pair of suspenders or other similar supporters.

Toy Torpedo Exploder.

Two sectional views are herewith shown of a toy torpedo exploder which is the patented invention of Mr. Searcy T. Hutchinson, of San Antonio, Texas.—The body 1 of the device is substantially in the shape of a ball of metal, and has formed therethrough a main central opening 2 and



a secondary lateral opening 3 disposed at right angles to the opening 2 and communicating therewith. The main opening is enlarged adjacent to its normal lower end, thereby producing an upper seat or anvil 4, which is accessible through the opening 3, and is designed to receive and sustain the caps or torpedoes which are to be exploded. A hammer or movable member 5 extends through, and is slidably disposed within, the opening 2. It is provided adjacent to its normally lower end with a laterally extended portion or striker 6, which, during the operation of the device, moves into the enlarged portion of the opening 2 and acts upon the anvil 4 for exploding the torpedo. The upper end of the hammer 5 is perforated, so that a string or cord 7 can be readily secured thereto by means of which the toy is handled in the usual manner.

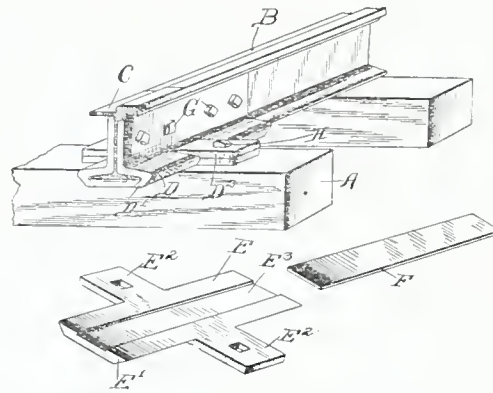
Rail-Joint.

Edward H. Schwartz, of Chicago, Ills., has obtained a patent on an improved rail-joint, especially adapted for electric car tracks, in which it is necessary to have good electrical connection between the ends of adjacent rails.

The object of the invention is to provide a strong, simple, inexpensive and effective rail-joint, which may be readily and quickly applied, and which may be provided with means for effectively establishing electrical connection between the adjacent ends of the rails, and which shall not be readily displaced.

The structure comprises a base plate E, the opposite edges of which are beveled upwardly and outwardly. The base plate is provided with lugs E² extending outwardly, and furthermore has in its upper face, a seat E³. A contact strip F is located in the seat. A pair of fish plates D are provided with downwardly and inwardly projecting flanges arranged to engage

the beveled edge of the base plate, so as to draw the same tightly against the under surface of a rail mounted

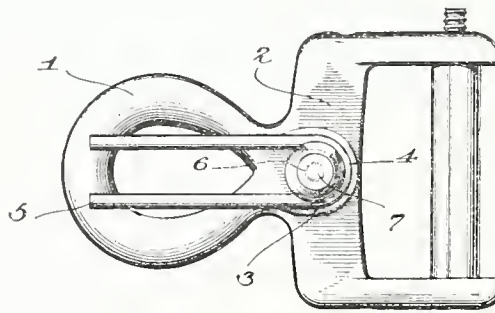


upon said base plate, and clamped between and by said fish plates. These fish plates are furthermore provided with outwardly extending lugs, and means, in the form of clamps D², are employed for securing the lugs on the base plate and the lugs on the fish plates to each other.

An Improvement in Cockeyes.

A simple but important improvement in cockeyes has been patented by Mr. Edward Franklin Butler, of Whitewater, Wisconsin.—The object of the invention is to provide certain and positive means for preventing the accidental disconnection of the cockeye from the hook of the singletree, to obviate rattling, and to reduce the cost of manufacture of such devices to a minimum.

Referring to the accompanying view of the improved device, the cockeye is designated by the reference numeral 1, and is of the shape commonly in use, except that its shank 2 is provided with a socket 3 to receive the crest 4 of the safety spring attachment 5. The socket is approximately U-shaped, so as to conform to the bend of the safety attachment. The shank is provided with a transverse orifice 6, through which is passed a rivet 7, the head of which is of sufficient size to bear upon the crest of the attachment, and thus firmly and securely clamp it within the socket.

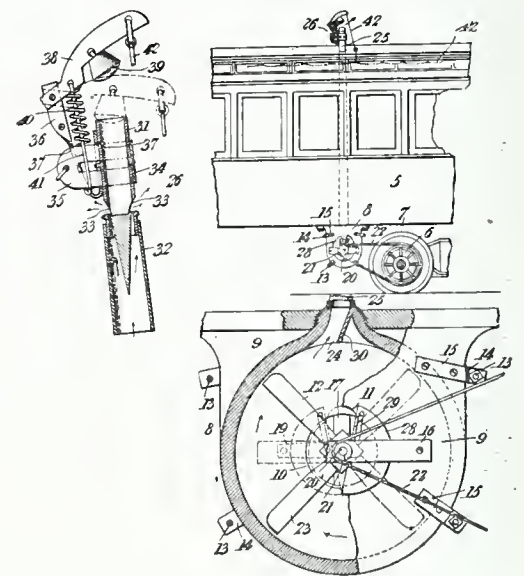


The arms of the safety attachment are disposed in parallel relation, and their terminals bear upon the loop of the cockeye. They are of resilient metal, preferably of tempered brass or steel, and are so disposed that they will engage the hook of the singletree with sufficient force to preclude any possibility of the accidental detachment of the cockeye therefrom, and at the same time, these arms obviate rattling.

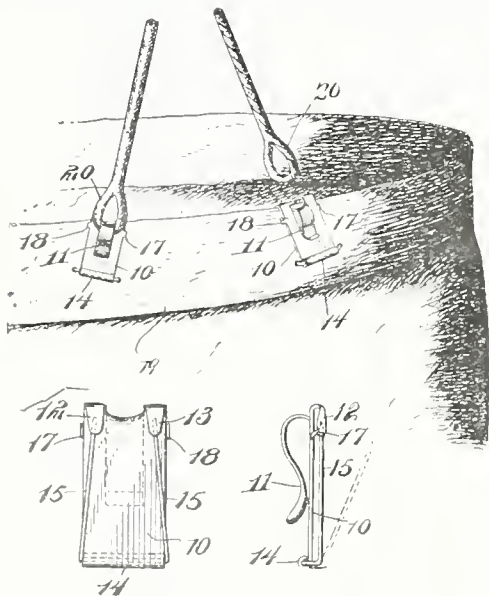
Whistle.

A novel whistle for railway cars, automobiles and other vehicles patented by Mr. Albert Franklin Kuhl, of Vanwert, Ohio.—An object of the invention is to provide a whistle operated by a blast of air from a fan mounted on the vehicle-frame and geared in any suitable manner to the motor, axle, or other movable part of the vehicle, for the purpose of giving warning of the approach of the vehicle by the production of a note or sound of great carrying power.

As shown in the accompanying illustration, a fan 12 is mounted beneath the car or vehicle body, and is connected by a belt 22 with the motor or wheels of the vehicle. The fan casing 9 is provided with detachable walls and with pivoted dampers for controlling the admission of air. An air conducting pipe 25 extends from the upper portion of the casing to the top



of the car or vehicle, and mounted in the upper end thereof is a whistle tube 31 having oppositely disposed blowing orifices 33. A sleeve or collar 34 is mounted on the whistle tube, and a bracket 36 is secured to this collar. A valve 39 is pivoted to the bracket, and is movable to a position to close the upper end of the whistle tube, while a spring interposed between the collar and the valve, normally holds the valve raised. With this construction, as long as the car or vehicle is in motion, air will be forced through the conducting tube 25, and through the whistle tube; but the upper end of this tube being open, the air can pass freely therethrough without making any noise. If, however, the valve 39 is drawn downwardly so as to close the upper end of the tube, then the air will have to escape through the blowing openings 33, thus causing the blast of the whistle.



a centrally arranged tongue bent to form a hook 11. A pair of spaced tongues 12 and 13 form guards that extend longitudinally of the rear side of the plate, and at the opposite side is a sleeve 14, in which is pivotally mounted a double pronged pin 15.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

UNITED STATES FASTENER CO. v. BRADLEY.

(Circuit Court, S. D. New York, February 16, 1906. 143 F. R. p. 523.)

1. PATENTS—VALIDITY AND INFRINGEMENT—SEPARABLE BUTTONS.

The Pringle patent, No. 580,000, claim 1, for a separable button catch designed for use with a stud member to form a separable button or fastener, is for an operative device disclosing novelty and utility, and was not anticipated; also held infringed by the device of the Bradley patent, No. 735,655.

2. JUDGMENT—RES JUDICATA—DISMISSAL WITHOUT HEARING ON MERITS.

To constitute an adjudication of a cause of action which will bar a second suit thereon between the same parties, the judgment or decree must have been rendered after a trial or hearing on the merits, and it will not have such effect where it was a decree of dismissal in effect for failure to prosecute.

THOMSON-HOUSTON ELECTRIC CO. v. ILLINOIS TELEPHONE CONST. CO. et al.

(Circuit Court, N. D. Illinois, E. D. Feb. 26, 1906. 143 F. R. p. 534.)

1. PATENTS—EFFECT OF EXPIRATION—COMBINATION CONTAINING PATENTED ELEMENT.

On the expiration of a patent for a combination, the use of such combination becomes free to the public, notwithstanding the fact that it contains as one of its elements a device covered by another patent to the same patentee which has not expired.

2. SAME—SUIT FOR INFRINGEMENT—ESTOPPEL.

The seller of a machine intended to be used in connection with a device covered by a patent owned by him, and which is inoperative without such device, impliedly grants the right to the purchaser to use it, and is estopped to maintain a suit to enjoin such use as an infringement of the patent.

3. SAME—PRELIMINARY INJUNCTION—CONDUCTOR SWITCH FOR ELECTRIC RAILWAYS.

A motion for a preliminary injunction to restrain infringement of the Van Depoele patent, No. 424,695, for a conductor switch for electric railways, by the use of the device of the expired patent No. 393,278, to the same patentee, denied.

AMERICAN BRAKE SHOE & FOUNDRY CO. v. RAILWAY MATERIALS CO. et al.

SAME v. WESTERN IRON & STEEL CO. et al.
(Circuit Court, N. D. Illinois, E. D. Feb. 26, 1906. 143 F. R. p. 540.)

1. PATENTS—INVENTION—ADAPTATION OF DEVICE TO NEW ART.

The strengthening of iron castings by the insertion of wrought iron bars or rods in the process of making belongs in the casting or foundry art, and not in the art in which the particular casting may be used, and the employment of the device in casting brake shoes, after its use for the same purpose in casting sleigh runners, annealing boxes and other articles did not constitute its transfer and adaptation to a new art, nor involve invention.

2. SAME—CASTING BRAKE SHOES.

The Herron patent, No. 423,996, for a brake shoe having wrought iron bars imbedded in the casting for the purpose of strengthening it, is void for lack of invention, in view of the prior casting art.

KOERNER v. DEUTHER et al.

(Circuit Court, W. D. New York, Feb. 7, 1906. 143 F. R. p. 544.)

1. PATENTS—INVENTION—PRINTER'S DRYING RACKS.

The Koerner patent, No. 392,735, for drying racks for lithographers and printers, while of narrow scope in view of the prior art, was not anticipated, and discloses patentable invention in its feature of so constructing the trays or racks that they slide upon and interlock with each other to form a stack, and facilitate handling and moving. Also held infringed.

2. SAME.

The Koerner patent, No. 504,985, for a drying rack for lithographic or printed sheets, which covers an improvement on the

device of the prior patent, No. 392,735, to the same patentee, is void for lack of invention.

BRISTOL OIL & GAS CO. v. BEACOM et al.

(Circuit Court, N. D. West Virginia, March 18, 1905. 143 F. R. p. 550.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction should not be granted to restrain infringement of a patent which has not been adjudicated, where the proofs leave the question of its validity in doubt, especially when it appears that defendants are financially responsible.

ELECTRIC VEHICLE CO. et al v. BARNEY.

(Circuit Court, S. D. New York, January 27, 1906. 143 F. R. p. 551.)

COURTS—CONFLICTING JURISDICTION—PATENTS—SUIT FOR INFRINGEMENT—GROUNDS FOR STAY.

The pendency of a suit for infringement of a patent is not ground for staying a second suit in another circuit against a different defendant for infringement by a different machine.

VAN EPPS v. UNITED BOX BOARD & PAPER CO.

(Circuit Court of Appeals, Second Circuit, January 23, 1906. 143 F. R. p. 569.)

1. PATENTS—VALIDITY—INCORRECT STATEMENT OF PRINCIPLES OF OPERATION.

Where a patent discloses means by which a novel and successful result is secured, it is immaterial whether the patentee understands or correctly states the theory or philosophical principles of the mechanism which produces the new result.

2. SAME—ANTICIPATION—DEVICES NOT PRACTICALLY OPERATIVE.

Where prior patents, or the machines constructed under them, embody the principle covered by a later patent, and sufficiently disclose the invention claimed therein, they are not deprived of their effect as anticipations by the mere fact that such machines are not capable of successful practical working, because of objections as to minor matters of detail in construction.

3. SAME—INVENTION—CHANGE IN FORM OR DEGREE.

It is not patentable invention merely to carry forward an invention shown in a prior machine by a change only in form, proportions or degree or the substitution of equivalents, doing substantially the same thing in the same way by substantially the same means but with better results.

4. SAME—INFRINGEMENT—PULP SCREENING MACHINE.

The Victory patent No. 417,451, for a pulp screening machine was not anticipated, and discloses a patentable invention of merit, but, as limited by the prior art and by the proceedings in the Patent Office, held not infringed.

LOS ANGELES ART ORGAN CO. v. AEOLIAN CO. et al.

MURRAY M. HARRIS ORGAN CO. v. SAME.

(Circuit Court of Appeals, Ninth Circuit, February 5, 1906. 143 F. R. p. 580.)

1. PATENTS—SUIT FOR INFRINGEMENT—EXTENT OF USE OF DEVICE.

That the device of a patent was publicly used and exhibited in actual use for two years is sufficient to sustain a suit for infringement without a showing that it has been in constant use since that time.

2. SAME—VALIDITY—PRESUMPTION FROM GRANT.

Due consideration must always be given by the court or jury, as the case may be, to the presumption of validity arising from the grant of a patent, and the real question in all cases is whether or not the evidence in the case is sufficient to overcome such presumption.

3. SAME—CONSTRUCTION OF CLAIMS—GENERIC CLAIMS.

A pioneer inventor is entitled to a generic claim, and may also include specific claims in the same patent, and in such case the broad claims are not, prima facie, to be restricted by reading into them the specific devices claimed in the narrower ones.

4. SAME—VALIDITY AND INFRINGEMENT—REGULATOR FOR MECHANICAL MUSICAL INSTRUMENTS.

The Tremaine & Pain patent, No. 552,796, for improvements in mechanical musical instruments using perforated music sheets, by which two such sheets in two separate organs or a bank organ, are made to move

in unison, so that the instruments will play without variation in time, is valid, and embodies an invention of such novelty and importance as to constitute a distinct step in the progress of the art, and to entitle its claims to a broad and liberal construction. As so construed it is infringed by the device of the Fleming patent, No. 659,442, which, although differing in details, embodies and appropriates the essential principles of the earlier invention.

NATHAN et al. v. HOWARD.

(Circuit Court of Appeals, Sixth Circuit, March 9, 1906. 143 F. R. p. 589.)

1. PATENTS—INFRINGEMENT—GAS BURNING STOVES.

The Howard patent, No. 626,997, for improvements in heating stoves designed to secure the more perfect combustion of gases by means for introducing heated air above the fuel, was not anticipated and discloses invention; the construction shown being more effective to secure the result sought than any in the prior art. Also held infringed by a construction which is only colorably different from that patent.

2. SAME—COLORABLE ALTERATIONS.

Neither the joinder of two elements of a patented combination into one integral part, accomplishing the purpose of both and no more, nor the separation of one integral part into two, together doing precisely or substantially what was done by the single element, will evade a charge of infringement.

3. SAME.

The impairment of the function of a part of a patented structure, by omitting a portion, will not avoid infringement, nor will a mere change of form, when the principle of operation is preserved and appropriated.

FORCE v. SAWYER-BOSS MFG CO. et al.

(Circuit Court of Appeals, Second Circuit, January 20, 1906. 143 F. R. p. 594.)

1. PATENTS—DAMAGES FOR INFRINGEMENT—SUFFICIENCY OF PROOF.

A complainant is entitled to recover only nominal damages on account of the competition of defendant by the sale of an infringing article, where on the accounting it does not furnish evidence showing the amount of its loss on that account, or even the profit it made on the patented article when sold.

2. SAME—PROFITS.

Where the devices covered by a patent were mere improvements in the line of simplicity of construction and consequent saving in cost of manufacture, and there is no satisfactory evidence that they rendered the machine as a whole more salable, an infringer is only liable for profits realized from the use of the patented parts which were new and wrongfully appropriated by him, and the complainant must furnish evidence from which the profits may be thus apportioned.

PLOTTS v. CENTRAL OIL CO. OF LOS ANGELES.

(Circuit Court of Appeals, Ninth Circuit, February 5, 1906. 143 F. R. p. 901.)

PATENTS—SUIT FOR INFRINGEMENT—EQUITY JURISDICTION.

Where, on the hearing of a suit in equity for infringement of a patent, in which an injunction and accounting were asked, it was shown that defendant made and used but one of the patented articles about which there was any dispute as to complainant's consent, and that a royalty for its use was agreed on, which defendant promised to pay, and there was no evidence of defendant's insolvency, or of any profits to be accounted for, or tending to show any threat or intention to use the patented article without complainant's consent, the bill was properly dismissed, on the ground that no case was shown for the exercise of equitable jurisdiction.

THOMSON-HOUSTON ELECTRIC CO. v. HOLLAND et al.

(Circuit Court, N. D. Ohio, E. D. February 20, 1906. 143 F. R. p. 903.)

1. COURTS—PREVIOUS DECISIONS AS PRECEDENTS.

The decision of a Circuit Court of Appeals sustaining the validity of a patent, especially where such court has had the same or related patents before it in a number of cases, should be followed by a Circuit Court in another circuit where there are no conflicting decisions.

2. PATENTS—INFRINGEMENT—TRAVELING CONTACT FOR ELECTRIC RAILWAYS.

The Van Depoele reissued patent, No. 11, 872 (original No. 495,443), for a traveling

contact for electric railways, held valid and infringed.

3. SAME—INJUNCTION—SCOPE.

An injunction against infringement of a patent should not be made so broad as to prevent the defendant from making and selling a device which it had added to that of the patent and designed to be used with it.

AMERICAN FOG SIGNAL CO. v. COLUMBIA FIRECRACKER CO. et al.

(Circuit Court, N. D. Ohio, E. D. February 14, 1906. 143 F. R. p. 907.)

PATENTS—INFRINGEMENT—RAILROAD TORPEDOES.

The Weaver patent, No. 667,813, for a railroad torpedo, held not anticipated, to cover a novel and useful device, and valid as against the defense of prior invention by a defendant. Also held infringed.

LOCKE INSULATOR MFG. CO. v. LEY et al.

(Circuit Court, D. Massachusetts, January 26, 1906. 143 F. R. p. 911.)

PATENTS—INVENTION—INSULATOR PIN.

The Locke patent, No. 493,434, for an insulator pin comprising a base having a central opening, an insulating sleeve mounted thereon, and a bolt for securing them together and to the cross-arm, does not specify the material of which the base is to be made, and contains no suggestion that it is to serve any purpose other than that of a support to the insulating sleeve, and cannot be construed to cover the use of an insulating base for the purpose of securing an added insulation, but only as a mechanical structure; and, as such, it is void for lack of invention.

WESTINGHOUSE ELECTRIC & MFG. CO. v. CUTTER ELECTRICAL & MFG. CO.

(Circuit Court of Appeals, Third Circuit, February 27, 1906. 143 F. R. p. 966.)

PATENTS—INFRINGEMENT—AUTOMATIC ELECTRIC CIRCUIT BREAKER.

The Wright & Aalborg patent, No. 633, 772, for an automatic electric circuit breaker, claims 2 and 5, construed, and held not anticipated, but to disclose patentable novelty and utility; also held infringed.

STANDARD ELEVATOR INTERLOCK CO. v. RAMSAY et al.

(Circuit Court of Appeals, Third Circuit, March 6, 1906. 143 F. R. p. 972.)

PATENTS—PRIOR USE—LOCKING DEVICE FOR ELEVATORS.

In the Muckle and Teamer patent, No. 555,825, for a locking device for passenger elevators, claims 1 and 2 are void; being so broad as to include a device previously in use by others on which the invention of the patent is an improvement, but fully covered and protected by the other and more specific claims. Also held not infringed if conceded validity.

SAWYER SPINDLE CO. OF MAINE v. CARPENTER.

(Circuit Court of Appeals, First Circuit, February 23, 1906. 143 F. R. p. 976.)

1. PATENTS—TERM—EXPIRATION OF PRIOR FOREIGN PATENT.

The amendment of Rev. St. § 4887, by Act March 3, 1897, c. 391, 29 Stat. 692 [U. S. Comp. St. 1901, p. 3382], did not affect patents previously issued, either as to their validity or length of term, and such a patent covering an invention previously patented in a foreign country remained as to length of term governed by the original section and not by section 4884 [U. S. Comp. St. 1901, p. 3381.]

2. SAME.

The amendment of Rev. St. § 4887, as previously amended by Act March 3, 1897, c. 391, 29 Stat. 692 [U. S. Comp. St. 1901, p. 3382], by Act March 3, 1903, c. 1019, 32 Stat. 1225 [U. S. Comp. St. Supp. 1905, p. 693], does not affect the term of patents for inventions previously patented in a foreign country, but only their validity, and did not operate to revive such a patent which had previously expired under the provisions of the section as it originally stood.

3. SAME—SPINDLE SPOOL FOR SPINNING MACHINES.

The Sherman patent, No. 363,425, for a spindle support for spinning machines, expired in 1897, with the expiration of the Bristol patent, for substantially the same invention.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

Edwin G. Nicewaner, inventor, Pittsburgh, Pa.; Alexander Reed, assignee, New York City. Theatre Curtain Operating Means.—With the ordinary theatre curtain, the weight of such curtain is depended upon to lower it; but in case of emergency, as for instance, in a fire, the draft across the stage or some other impediment may prevent the downward movement of the curtain. The present invention is designed to overcome any danger of this character, by providing means which will effect the positive downward movement of the curtain. To this end, a motor is located beneath the stage, and is connected by cables to the opposite lower corners of the curtain. The motor may be of any desired character, but it is preferably a hydraulic motor, and the means of operating it can be controlled either from the stage or from any part of the theatre. Thus in case an emergency calls for the immediate lowering of the curtain, an operator in any part of the house can start the motor, whereupon the curtain will be quickly and positively lowered.

Frank R. Wilson, Llano, Texas, and George Mansell, Durant I. T. Pump.—The object of this invention is to provide an improved construction, which operates effectively to quickly lift the water from a well or other source of supply to the surface of the ground, the several parts of the pump being simple in construction and readily separable for the purpose of access thereto for repairing any of the worn parts. A casing is provided having a plurality of working barrels with valved piston buckets fitted in the barrels. A lazy tongs mechanism is contained in the pump casing between the barrels, and is operatively connected with the piston buckets to reciprocate the lower piston bucket in the opposite direction to, and simultaneously with, the upper piston bucket upon the movement of the latter. An ordinary pump handle or lever is connected to the upper piston bucket. With this arrangement, when the lever is swung in one direction, one of the piston buckets moves downwardly, while the other moves upwardly, and the reverse movement is secured upon the reverse movement of the lever. Consequently there is a continuous stream of water flowing as long as the handle is operated.

Milton B. Anderson, Minneapolis, Minn. Vehicle Top.—This is a folding vehicle top or calash. It constitutes an efficient covering, will compactly fold, and when folded is entirely out of the way. It may be applied to, and detached from, a vehicle with ease and without the necessity of a wrench or other tool. Furthermore, means are provided for supporting side curtains so that they can be readily adjusted, removed and replaced. The top consists of a sectional hinged frame with cross bows, the whole being constructed to compactly fold. The supports for the sides are in the form of crossed hinged and slidably connected members, the lower ends of which are provided with novel hooks, whereby they can be easily detached. The side curtains are provided with runners that operate in slides or guideways formed upon the top. These curtains are arranged so that they can be moved back of the top, or they can be taken off if desired.

John R. Uncapher, Plumville, Pa. Combination Check Ease. The unyielding strain of the ordinary check reins is unquestionably trying upon a horse, and the present invention aims to solve the difficulty by providing a check ease, which while holding the animal's head under the strain of a check rein, will permit a yielding movement. The device consists of a casing that is adapted to be secured to a harness saddle, and is provided with an end closure detachably mounted on the casing. A check holding device is employed consisting of a substantially U-shaped member having spaced shanks that are slidably mounted in separate compartments of the casing. Coiled springs are fitted upon the shanks, and are located within the compartments, and fastening devices pass through the casing between the compartments. The check-rein is hooked to the U shaped member, which is thus yieldingly mounted.

William A. Beamer, Mt. Vernon, Ohio. Pie Crimping and Cutting Device.—This is an exceedingly simple and convenient instrument for simultaneously crimping or compressing the upper crust of a pie upon the lower crust, and at the same time trimming the crusts to the size of the pie plate. It consists of an expansile and contractile compressing ring having slidably overlapped end portions and provided with a depending annular flange having slidably overlapped end portions. The flange constitutes the cutting device, and the ring forms the crimper, it being preferably corrugated. A handle element is secured to one end of the flange, and another handle element is carried by an intermediate portion of the device, and is movable toward and from the first mentioned handle in order to contract and expand the ring. In using the device, after the pie has been made, the ring is placed in position, and forced downwardly, thereby cutting the crust and crimping the margins thereof.

Richard S. Townsend, Union City, Mich. Sprocket Wheel.—It is a well known fact that the rim and teeth of a sprocket wheel are the only parts subjected to wear, and the present invention aims to produce a structure wherein such parts can be readily replaced by new ones without the necessity of renewing the entire wheel. The sprocket wheel consists of a hub that is composed of sections, each section having radially disposed spokes. The spokes at the ends of the sections are arranged in divergent relation and have their outer ends spaced apart. Means are employed for securing the hub sections together, and rim sections are provided with inwardly extending flanges, the inner faces of which are abutted against the outer ends of the spokes, the corresponding ends of said rim sections being abutted and respectively located at the intermediate spoke of each of the hub sections. Ears are carried by the flanges of the rim sections and project beyond the same. These ears lie alongside the outer ends of the spokes, and fastening devices detachably secure the spokes and ears together.

Joseph L. Mariner, Meyersburg, Mont. Hydraulic Motor.—The object is to provide a novel construction, wherein a plurality of streams of water are directed from a series of nozzles against a rotary wheel, and to employ means whereby the discharged water after having acted upon the wheel, is directed away from the same, thereby eliminating a great deal of frictional resistance. Another object is to provide an arrangement wherein all end thrust is obviated, the mechanism being such that the motor can be readily dismembered, and the parts are all entirely accessible for repair or renewal.

To carry out these objects a casing

is provided having detachable end walls, and a shaft extends through the casing. Fixed to the shaft within the casing, is a wheel provided with peripheral flanges, between which are located open-ended buckets. These buckets having flared discharge openings extending alternately through opposite sides of the wheel. The end walls of the casing are provided with inwardly extending sleeves surrounding the shaft, carrying at their inner ends disks located on opposite sides of the wheel and terminating at the discharge orifices. Water is supplied to the casing through a semicircular pipe arranged around the outer side of the same, and having a series of nozzles that project into the casing and deliver the water into the buckets or pockets of the wheel. Each nozzle is provided with a valve for controlling it. With this mechanism therefore, the water is discharged from the nozzles against the periphery of the wheel, and entering the buckets is alternately discharged on opposite sides of said wheel, eliminating all end thrusts.

Frank B. Townsend, Penn Yan, N. York. Three patents.—One of the patents issued to Mr. Townsend discloses a brake mechanism for cars or other vehicles arranged to be controlled by the motorman, and to be operated by power derived from the movement of the vehicle, so that the brakes may be quickly applied without depending in any manner upon the motor employed for the propulsion of the vehicle. The controlling mechanism includes suitable devices located at opposite ends of the vehicle, and arranged when operated to throw in clutch mechanism, which serves to connect one of the driving axles of the vehicle with the brake mechanism, so that the rotation of the axle as the vehicle continues to advance, will cause the brake shoes to be moved into engagement with the wheels. One half interest in this patent has been assigned to Lewis D. Perrin, Rochester, N. Y.

The second patent covers a check controlled apparatus or vending machine, which with certain modifications has gone into very general use and may be found in most of the larger cities. The machine is designed to vend a plurality of different articles, such as gum, candy and nuts. A casing is provided having compartments for the different articles. Beneath these compartments is journaled a rock shaft having an exposed crank handle. Rotably mounted on the rock shaft are a plurality of rotary delivery devices that carry annular flanges having coin-receiving pockets. Coin chutes deliver to these pockets, and have receiving mouths opening through the casing. Within the flanges are located coin-engaging fingers and releasing cams that are fast upon the rock shaft. These parts are novelly combined and are so arranged that upon the introduction of a coin into one of the chutes, it will drop into the proper pocket, and thus upon the actuation of the crank, the delivery device will be moved to deliver the desired article.

The third patent covers an improvement in sash lock, and is particularly designed for car windows. The arrangement is simple and effective, and is so disposed that the greater portion thereof, with the exception of the operating handles, is housed within the frame and sash. In the structure set forth in the patent, the window frame is provided with a guide-way having a securing strip located at one side of the same. This strip has its exposed face substantially flush with the face of the frame. A holding device is secured in the sash, and comprises a frame with oppositely swinging members pivoted in the same and having fingers that stride the strip, the fingers of each member being spaced apart. A spring is mounted

on the frame and engages the members to urge the same apart. These members are provided with exposed lips that constitute means for actuating them.

Jehiel F. Wynkoop, Minneapolis, Minn. Spectacle Shade.—The present invention is an ingenious and simple device that can be applied to eye glasses or spectacles so as to prevent the reflection and refraction of light in the glasses or lenses, consequently eliminating an undesirable feature of spectacles when employed in reading or working by artificial light. The invention comprises shade elements that are constructed to fit upon the upper edges of the lenses, and are connected by a nose-piece. Yielding catches are arranged to engage the nose piece of the spectacle, and other yielding catches are carried by the outer ends of the lenses and engage the posts of the temples. The shade can thus be applied to practically any type of eye glasses.

Thomas A. Strode, inventor, Spruce, Mo.; S. B. Kash, same place, assignee. Vehicle Reach and Hound Wear Plate.—It is a well known fact that there is ordinarily considerable wear on the reach of a vehicle by the hounds rubbing against the same, and the object of Mr. Strode's invention is to provide means which will prevent this wear. To this end, he secures a wear plate against the under side of the reach, said wear plate being of greater length than the width of the hounds, and operating against the same. Spaced sets of upstanding ears are carried by opposite sides of the wear plate, and are secured to the opposite sides of the reach, while oppositely extending projections from the plate are located between the ears and extend over the hounds, these projections being provided with rearwardly extending brackets having upstanding ears secured to the reach.

James J. Cook, inventor, Jersey City, N. J.; Mungo J. Currie, assignee, same place.—Two patents. Both of these patents cover carbureters for explosive engines. The structure disclosed in the first patent comprises a casing having an opening, with a plug mounted in the opening and having a socket. A vaporizing post, formed of refractory metal, has an opening therethrough, and has one end fitted in the socket of the plug. A holding nut is threaded into the socket and maintains the post in place. A stem extends through the post and projects from one end thereof, and a heating coil secured to the projecting end, surrounds the post. The post is located within an inner casing or tube that projects through one end of the casing, and has a conducting pipe leading therefrom. A supply tube has a nozzle that projects hydrocarbon against the end of the post, and air is admitted through the end of the casing, from which the tube or inner casing projects.

The other patent covers a carbureter of a somewhat similar type, though more complete in detail. The outer casing has mounted in one end a vaporizing post comprising a series of cup-shaped foraminous disks that are located within an inner casing, to which the pipe leading to the engine is connected. The outer casing has a series of inlet openings with spring valves normally closing the same, means being provided for varying the tension of these valves. A preliminary mixing chamber is employed into which the fuel and air are admitted, the former being controlled by a novel automatic diaphragm dial. A conducting nozzle leads from the preliminary chamber, and has its discharge end in line with the vaporizing post.



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Armor Plate vs. Shells.

A constant struggle is going on between the firms that make armor plates and those that make guns and projectiles, though these firms are often rival departments of the same great establishment. The demand of the nations is for fighting ships. Money beyond computation is being poured into the huge floating forts which the world powers are launching. The warship is becoming increasingly complicated in machinery, calling for more speed, greater destructiveness on the part of its projectiles, and at the same time, greater immunity for itself. Russia, in face of the destruction of her fleet, has announced that she will spend 8,000,000 dollars in the reconstruction of a new navy. Great Britain already possesses the largest navy in the world, but it is announced that her admiralty is designing a battleship of 18,000 tons, with ten 12-inch guns in her main batteries, capable of firing a broadside of 850-pound shells, able to perforate two feet of the best armor now existing. Uncle Sam, not to be outdone, is planning a battleship of 20,000 tons displacement.

New kinds of guns, new gun mountings, new range-finding devices, new means of protecting guns, are being constantly developed. All modern projectiles are fired from rifled guns and are cylindrical in shape, with conical heads. To keep them point first and to correct deviation from the course, they are made to revolve on their own axis while traveling. This is the purpose of the rifling of the guns with spiral grooves. The projectile is made to follow the grooves by having a driving band of copper on the shell, which is rather larger in diameter than the bore of the gun. This band is forced into the grooves by the explosion of the charge, compelling the projectile to follow the grooves. The latest invention is to fit the projectile with ball bearings to avoid friction and damage to the grooves and inner tube of the gun. If practicable, this should enable an even higher velocity,

and thus a longer range, to be obtained from guns.

Armor piercing shot or shell goes through a special method of manufacture. It is made of the very best steel, sometimes alloyed to give additional strength. It is cast or forged to a size very slightly larger than its intended dimensions. A groove is turned round it to hold the driving band that takes the rifling, and the shot or shell is then barded by heating the head of it till red-hot and cooling it suddenly in water or oil. The scale produced by this process is ground off the shell, the driving band is pressed into its grooves by hydraulic power and turned down to its proper size, and the projectile is ready.

Improvement in armor has necessarily kept pace with improvement in guns. The old armor plates of wrought iron could keep out shells of a diameter equal to their own thickness, except at short range. The Palliser shot, however, with hardened point, soon disqualified iron plates. Then a steel face was welded to a wrought iron back. This was beaten and then plates were made wholly of steel. A fresh advance in projectiles was met by various hardening processes applied to the face of the steel plate. A splinter of Krupp hardened steel, it is said, will scratch glass like a diamond. This intensely strong resistive had the effect of either throwing off the projectiles when they struck at an angle, or of breaking them up even when they penetrated the plate. The makers of projectiles responded by fitting the points of their missiles with softer caps of mild steel, so that they should bite on the plates instead of slipping off when striking at an angle.

A minor improvement, but one that will avert such another disaster as occurred on the battleship Missouri last year, is an invention of two naval officers to prevent "flarebacks." The plan consists of drilling small holes about the size of a lead pencil through the breech of the rifle and entering the barrel just ahead of the breech plug. These holes are connected with a pipe that encircles the end of the weapon. Compressed air is supplied through this pipe, and as the breech block is withdrawn after a discharge, a powerful current is forced through the three holes slanting toward the muzzle, and everything that remains in the barrel of the gun is forcibly ejected—gases, flames, remnants of powder bags, or anything that might ignite the next charge placed in the gun.

It is not alone the armament of the ship that is being improved. Every detail of the huge fighting machine is subjected to constant scrutiny, in the hope of bettering the general efficiency in some way. The propelling engines are studied with a view to make their material of less weight and their driving power of greater force. The human mind does not easily grasp the meaning of the power concentrated in a ship like the great armored cruisers that are the latest additions to our navy—such as the Colorado and Pennsylvania. The engines generate energy that equals the united power of 250,000 men. Installed in a locomotive engine, they could

draw 1,200 railway cars at the rate of 30 miles an hour. This number of cars would stretch over six miles, and would carry an army of 36,000 men. But still the call is ever for more power, and the turbine engine is now depended upon by many to meet this demand. There is no doubt that this is the next epoch-making development to be looked for in the direction of greater power for warships.

The Weapons of the Future.

The wars of the future, declares Sir Hiram Maxim, will be fought in the air. Such an extreme statement would be accepted with incredulity, coming from a less authority than the inventor of the Maxim gun and the head of one of the largest gun manufactories in England. It is difficult to conceive of a more deadly weapon than the Maxim gun, capable as it is of dealing death to hundreds of men every minute, at a distance at which it can hardly be seen. Sir Hiram Maxim asserts that the limit of mechanical ingenuity in this direction has been reached. There are certain limitations imposed upon engineers by nature, and so far as guns are concerned, these have practically been attained. Unless some new metal or substance entirely different from anything now known can be discovered, no further improvements can be made in the construction of guns.

It has for sometime been recognized by the war departments of civilized countries, and has been the subject of serious consideration, that the largest and most costly guns are the shortest lived. The use of heavy charges has been found to cause erosion, which makes the life of the gun almost ephemeral. This was not so important a problem until the introduction of smokeless powder, when the great increase in velocity imparted to the projectile became general. The wear on the lining of the gun, with the employment of smokeless powder, is of a different kind from that previously experienced, being, instead of a deep guttering, a smooth and even wearing away of the surface, which proceeds with such rapidity that only 50 or 60 shots can be fired, instead of some 300, as formerly. In other words, after a couple of hours' steady use, the gun can no longer fire straight. The projectiles are not given the motion of rotation necessary to steadiness of flight, but to quote Sir Hiram Maxim again, the guns send shells head over heels, as one throws a club, all over the place. To illustrate the consequences of such conditions, he points out that if England wanted to bombard Boston, for instance, she would send over perhaps three men of war, each worth \$5,000,000. After a bombardment of a few hours the guns would be worn out; a few American cruisers might then come up with new guns, and sink the battleships. It would thus cost England \$15,000,000 to inflict say \$5,000,000 worth of damage.

On the other hand, when the aerial torpedo is perfected—something small and relatively cheap, which will be able to deal death and destruction in the form of explosives over the face of the earth—warfare will be revolu-

tionized. Imagine the state of a town which is attacked by half a dozen mechanical monsters out of reach in the heavens, constantly dropping into it dynamite bombs, each one perhaps capable of wrecking whole districts. Defense or retaliation will be impossible, and the expense of wiping out a city will be relatively trifling.

Sir Hiram Maxim, it may not be generally known, is a daring experimenter in aerial navigation, and has built several more or less successful airships. We have already, he declares, demonstrated the possibility of motion in the air, and have eliminated most of the serious obstacles which militated against its practicability in the past. We have now everything we need in the way of initial knowledge and data, and the introduction of the aerial torpedo is only a question of experiments. The Germans are already hard at work on the problem, and the authority cited believes that no money will be spared and the best scientific and mechanical brains in the fatherland will be employed in an attempt to wrest from nature the secret, first possession of which will make Germany mistress of the world.

Although war is terrible enough with the engines of destruction already known to science, when we come to using submarine boats and aerial torpedoes, it may well be expected that the very horror of conflict will enforce peace, as has long been predicted by economists.

Waste Products from Beets.

With the extension of the beet sugar industry in this country has come a growing interest in the utilization of the by-products. Molasses is the chief of these, and it is surprising to learn in how many ways this can be employed. In small quantities, it appears in the manufacture of brewers' yeast, in dyes and dyewood extracts, in shoe polish, chicory, table sirups, ordinary candies, etc. The increasing use of aniline colors for dyeing purposes has greatly reduced the consumption of molasses in the manufacture of the vegetable dyes. Formerly large quantities of the crude sirup were employed in making shoe blacking, but the great competition met with in the use of shoe dressing and creams has lessened the amount consumed for this purpose. On the other hand, it is used more and more for cattle feed. It is either fed directly to the animals in a thinned condition, or mixed with ground palm seed, rape seed, cocoa or peanut shells, dried brewers' grains, fresh blood, etc. Sometimes it is even used with peat, which has been found not only to be a good vehicle for carrying the molasses, but also to counteract any evil effects from the latter.

Other important waste products of sugar factories are the spent pulp from the presses and the beet cuttings. These are also considered excellent fodder, as they can be preserved for use throughout the winter. Even the mud remaining after the sugar beets are washed, is useful: it makes good fertilizer, especially for light soils. Part of the refuse liquor from the extraction of sugar is worked up into raw potash, which is also available as fertilizer, or may be employed at chemical works. In short, there are few industries to which scientific knowledge may be applied more effectively than the manufacture of beet sugar.

An Era of Tunnels.

Among the marvels of modern civilization may be counted many of the tunnels completed within the nineteenth century, and the great number of new ones that are projected justify the belief that the twentieth century will far outstrip the last one in these triumphs of engineering. Huge mountain ranges are pierced with rapidity and ease; broad rivers and estuaries of the ocean offer no obstacle to the work. Tunnels have been made for thousands of years; at the time of birth of Christ they had already reached such a development that the catacombs of Rome furnished convenient refuge for the early Christians. With the invention of gunpowder and the employment of blasting methods, the art entered upon a new era, and the rock drill and high explosives marked the beginning of still another epoch, which witnessed the construction of the Mont Cenis and Hoosac tunnels, and more recently, the longest of earth burrows—the Simplon.

The last named tunnel—the greatest of the great bores under the Alps—is just completed after having been in progress since 1898, and has thus taken nearly seven years to dig. Five thousand workmen were engaged on it, and its length is over 12 miles. Several new problems were presented in the course of the work; for instance, a great stream of hot water was struck near the middle of the tunnel, and the temperature, already warm from the great depth beneath the surface, was raised to such a point that labor was forcibly suspended until measures could be taken to provide cold air for the workmen. The vast enterprises recently completed at Boston, and those now in progress in New York, to overcome the river barriers, have also offered novel engineering problems; such as in subaqueous tunneling, the providing of air pressure within the bore strong enough to counterbalance the pressure of silt and water at the heading. The "caisson disease" and its treatment are also new features of subterranean labor. The employment of compressed air is likewise characteristic of the last decade; most novel of all is the use of freezing methods, as described in another column of this edition. With this advance in implements and processes has come a great expansion in projected undertakings, many of which—like the tunnel beneath the Hudson—have been revived and rejected many times but are now believed to be practicable. Before the middle of the century we may see the construction of a railway from Newfoundland to the St. Lawrence by means of a tunnel under the Strait of Belle Isle; the connection of Prince Edward's Island with the mainland of Nova Scotia by a passage beneath the sea; the uniting of the American and Asiatic continents by an all rail line under Bering Strait; the building of a tunnel from Europe to Africa, via the Straits of Gibraltar; and even the completion of that much-discussed enterprise—the digging beneath the English Channel, so as to connect Great Britain with France.

Raising Sunken Ships.

The property possessed by calcium carbide of giving off acetylene gas when brought into contact with water is to be employed in raising sunken vessels. The system depends upon the use of calcium carbide for setting free gas when brought in contact with water. At suitable points in the vessel cases of carbide are placed, which, when brought in contact with water, force out the latter, thus emptying the vessel. The method may also be used for emptying floats after they have been attached to the ship. The success of the process depends upon obtaining an equal buoyancy at the different parts of the vessel. For this purpose, cans of carbide are placed at the points which are to be emptied of water. They are fitted with explosive caps, which are set off simultaneously by an electric current. In this way the case is ruptured, water is admitted and the emptying of all compartments begins simultaneously.

Another novel method of raising sunken ships was resorted to in Canada some months ago, when a 12,000 ton vessel which was fast on a rock in the St. Lawrence river was floated by means of compressed air. The hatchways were sealed by riveting steel plates over them, and when all the vessel's compartments had been made air tight, the engines which had been set up on deck were started, and air was forced into the hull, driving out the water. The work took some time, but at last the ship floated to the surface.

Wire Glass.

Wire mesh glass is now being made for use in building, both for outside and inside walls. Constructors are recognizing the utility of this new material, which has valuable cohesive properties. Wire glass, or reenforced glass, is made by rolling two sheets of glass between which is placed a metallic grating. The result is a product of remarkable cohesion and tenacity, and in case of breaking, the plates of glass, instead of separating, remain adherent, held by the metallic grating. This is the chief advantage of the new material. Experiments have shown that a plate of wire glass slightly less than a quarter of an inch in thickness and a little over four feet long by eighteen inches wide, can support a weight of over a thousand pounds. Under thirteen hundred pounds it bent and cracked, but did not break. Wire glass, or reenforced glass, has another important property; a small building, the walls of which are made of this substance, resists a very hot fire on the inside, whereas an ordinary window breaks at the first touch of flame.

Such qualities obviously fit wire glass for roofing, shop windows and glass partitions, but its application to the construction of staircases is especially successful, as these staircases permit easy lighting of the descents into basements. The steps are not slippery, and in case of fire their superiority over wooden staircases is clear.

Audible Railway Signals.

There has been a tendency of late to employ audible as well as visual railway signals, in order to still further increase the security of travelers, and to relieve engineers from the strain of always looking for some particular signal or light. Several important inventions in this line are being tried. One of the most prominent of the British railways has installed a method of audible signaling as a substitute for the familiar semaphore. The new system, which is of especial value in a country like Great Britain where there are so many fogs, combines the use of audible signals with an automatic apparatus for arresting trains. It has been tried for a year or two with such satisfactory results that railway officials are now putting it on at important junctions, where traffic is heaviest. Wherever it is necessary on account of a dangerous curve or for any other reason to permanently reduce the speed of trains, it is claimed that this can be automatically accomplished so that the safety of passengers will not be jeopardized by careless or reckless engineers.

The system of signaling which is almost universally in use repeats in the signal box the condition of the signals which are controlled from that box. As many signals are not visible from the box from which they are operated, the value of this safeguard is obvious. The new invention carries this principle a further stage, and achieves an even more notable precaution by repeating the state of the signals not only in the signal box but in the cab of the locomotive, and so insures that the engineer shall at all times have a clear view of the condition of the signals on the road over which his locomotive is to run. This is accomplished by means of pneumatically operated miniature semaphores fitted up in the cab of the engine. Opposite each line signal a set of "trippers" in duplicate is placed, which are connected electrically and mechanically with the ordinary signaling apparatus, and stand erect or lie flat according as the signals show "danger" or "line clear." Beneath the locomotive are two striking levers moving either way, which project such a distance as to meet the trippers when they are erect and to pass over them altogether when they are lowered. When "danger" is signaled, therefore, the striking lever is thrown back by the upstanding trippers, with the instant result that the semaphores in the cab of the engine faithfully reproduce the signal, and the levers, after striking the trippers, remain securely locked until released by the engineer. But this is not all. Should the driver for any reason disregard the signal, his train is automatically pulled up quite independently of his own operations, and simultaneously a warning note is sounded by a horn on the locomotive, so that he is warned of his position both by visual and audible signals. At the same moment the signalman is warned of the irregularity by means of a special repeater fitted in the signal box, and an alarm bell is set going and con-

tinues ringing until he acknowledges it by pressing a plunger in the repeater.

In actual operation, all this is said to be much simpler than appears from the description. So easily and with such prompt response does every part of the apparatus work that the probability of any portion of it being thrown out of gear is, to say the least of it, exceedingly remote. But should such a contingency occur, either from accidental breakage or deliberate tampering, the mishap can scarcely be attended with any element of danger. Complete provision is made for a contretemps of that sort. The immediate effect of the failure of any part of the apparatus to fulfill its appointed task would be that both the driver and signalman would be warned, and the line upon which the accident occurred would be blocked. If the tripper mechanism, for instance, were to be put out of action, the signalman would be given instant warning—a disk would fall on the repeater in front of him disclosing the words "Out of order" and at the same time an alarm bell would ring. Moreover, if any breakage should take place, its rectification would be a matter of very little time and trouble, as all parts of the system are interchangeable. Breakages, indeed, are said to be rare. A locomotive which has been fitted with this apparatus for two years, and has been in constant use, still has every part of its mechanism in first class order.

Slate as a Building Material.

Many new materials are being used in modern construction, and among these slate holds an important place. It seems to have been designed by nature for use where a clear, non-absorbent surface is required. It is strong and durable, and can be made neat and even decorative where adornment is desirable. As the surface is perfectly smooth, it will not absorb oils or odorous or decaying organic matter; it is also not affected by acids, being even better than marble in this respect.

Slate is impervious to water, air and changing weather conditions, and is not sensibly affected by ordinary variations in temperature. Among the uses to which it is put are bathtubs, wash trays, kitchen sinks, dairy purposes, drainage, cisterns, laboratory vessels, etc. For all these purposes, as well as for many others, the slate is first prepared at the factory, according to measurements supplied by the contractor, and all that the latter has to do is to set the material into place, after it has been fitted at the factory before shipment. Slate employed for such purposes can be used in its natural color, or it can be given any tint or almost any figure desired. There is a process of marbleizing slate, by which all kinds of marble, granite, wood or tiling material can be imitated so successfully that it requires an expert to distinguish them.

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Saw gage and jointer..... J. P. Olson
Saw handle. Crosscut..... A. S. Patton
Saw setting machine..... H. Watkins et al
Sawing machine..... S. J. Gray et al
Sawing machine..... O. C. Hoar
Sawing machine..... J. G. Pedley
Scale recorder..... F. B. Hays
Seal..... L. A. Foote
Seal. Car door..... C. Columbus
Seat back for drivers' seats..... R. H. Yale
Selling machine. Automatic..... W. Abel
Separator..... W. M. Cook
Sewage purifying apparatus..... A. Vogelsang
Shade adjuster. Ball bearing window..... J. Renner
Shafts. Means for indicating relative movement of parts of rotating..... A. Amsler
Sharpening. Knife..... B. Nichols
Shaving cup..... C. W. Taylor
Sheet delivery mechanism. Conducing and collating device for..... F. Waite
Sheet metal hanger legs. Apparatus for forming..... H. T. Hallowell
Shock handling attachment for crop treating machines..... J. B. Schuman
Shock loader..... J. K. Sharpe, Jr
Shoe tree..... W. L. C. Niles
Shut off. Automatic..... T. F. Goodfellow
Shuttle box operating mechanism..... H. Cane
Signal..... P. Marwedel
Signal apparatus..... W. B. Lane
Signaling apparatus. Electrical..... J. D. Peachey
Signaling system. Electrical..... E. R. Brodton
Silk. Weighing..... C. Simon
Skid setting gage..... F. Hughes
Skirt Hoop..... M. J. Hosac
Snow thawing machine..... W. Elliot
Soap molding battery..... F. Holoubek
Sole trimming and channeling machine. Shoe..... W. E. Small et al
Specialist's chair..... C. N. Leonard
Spinning machine top roll..... W. G. Ragsdale
Splice bar..... W. J. Mattern
Sprocket chain..... G. C. Horst
Stairway. Spiral..... G. Holden
Staple blank or strip..... E. T. Greenfield
Staple puller..... T. J. Alsop
Steel connecting bar. Pressed..... N. McInnes
Stencil frame..... J. S. Duncan
Stencil perforating device..... S. Pryor
Stereotype apparatus. Casting box for..... J. L. Firm
Sterilizer..... H. P. Bacon
Storm apron..... A. J. Miller
Stove..... C. Ayres
Street cleaning machine..... F. Ebner
Stretching frame..... E. McCombie

Stuffing box..... M. Berecky
Sunken bodies. Apparatus for searching of..... M. von Scholtz
Superheating boiler..... F. Burger et al
Surveying bore holes. Means for..... H. F. Marriott
Suspenders..... C. A. Murray
Switchboard cord reel..... R. E. B. Craft
Tachometer..... F. M. Carroll
Tank supporting structure..... A. K. Mansfield
Tape punching register..... J. L. Du Frane
Target trap..... J. W. Haughwout
Telephone hook switch..... G. D. Foster
Telegraph. Duplex..... J. W. Larish
Telephone system..... H. G. Webster
Telephone transmitter..... A. Larsson
Tent stake..... N. S. Dunnington
Testing device..... A. M. Mattice
Thermo electric generator..... W. H. Bristol
Thermostatic apparatus..... K. Rostel
Thill or tongue support..... L. L. Roark
Thinner..... W. B. Moss
Threshing machine feeder..... C. D. Markey
Threshing machines. Automatic pitcher and self feeder for..... G. C. Wiles
Tide motor..... J. E. Lemery
Time detector. Watchman's..... J. Zausmer
Tire..... G. E. Heyl-Dia
Tire releasing tool. Clencher..... J. E. Glickert et al
Tires. Making shoes for pneumatic..... J. W. Hyatt
Tobacco cutting machine..... L. Aptekman
Tobacco stemming and booking machine..... B. McGregor
Toy battle ship..... W. T. Wood
Toy crossbow..... O. H. Sawdy
Transformer..... W. S. Moody
Transformer. Steam..... S. Otis
Trestle..... J. M. Normand
Truck. Railway car..... S. Otis
Trunk..... F. M. Lee
Tunnel and constructing the same..... R. H. Keays
Tunneling through rocks..... P. Ford
Turbine..... R. H. Goldsborough
Turbine. Compound steam..... F. Burger
Turbine. Elastic fluid..... R. H. Rice
Turbine. Steam..... H. P. Hill
Turbines. Diaphragm and nozzle construction for..... O. Junggren
Turbo generator..... 2 pats. J. G. Callan
Turpentine gathering receptacle..... H. M. Winchester
Type bar machine..... A. J. Kletzer et al
Type writer..... G. W. Donning
Type writer attachment..... J. Edwards
Type writer attachment..... R. W. Scoggin
Type writer. Electrical..... G. W. Donning
Type writer selecting and operating means. Electrical..... G. W. Donning
Type writer work guide..... G. W. Donning
Type writing machine..... H. L. Wagner
Umbrella holder. Expanded..... E. Nootbaar
Umbrella support..... A. J. Adams
Umbrella support..... J. C. Williams
Valve..... 2 pats. H. Jones
Valve..... A. Harkness
Valve..... C. D. Ballard
Valve..... J. H. Simms
Valve. Check..... N. C. Locke
Valve. Compression and vacuum relief..... E. B. Whelan
Valve. Engine..... O. W. Young
Valve for steam heating systems. Automatic relief..... T. F. Dexter
Valve. Gate..... N. W. Race
Valve. Non return..... J. R. Tenner
Vegetable matter. Apparatus for recovering products from..... R. H. Partridge
Vehicle..... S. D. Maddin
Vehicle body support..... E. G. Hines
Vehicle footboard. Adjustable..... J. Hage
Vehicle gear..... F. E. Wilcox
Vehicle. Pleasure..... W. T. Adams et al
Vehicle runner..... W. M. Hoag et al
Vehicle suspension device..... G. Diezemann
Vending machine..... J. Vierling
Veneer drying and straightening machine..... F. N. Morey
Ventilator..... F. L. Hargreaves
Vessel cover and liquid shaker..... H. Paton
Veterinary forceps..... M. Savidge
Volute spring..... A. Stucki
Voting machine..... C. M. Warner
Wagon. Boulevard and speed..... E. E. Bullock
Wagon brake. Transfer..... N. C. Bassett
Wagon dumping..... R. M. Wilson
Wagon loader..... E. E. Rothacher
Wagon Transfer..... N. C. Bassett
Wall brace or tie..... A. T. Lewis
Walls. Collapsible core for plastic building..... W. E. De Lhorbe
Walls. Form for plastic building..... W. E. De Lhorbe
Washing machine wringer support..... W. S. S. Rodgers
Watchcase pendant..... A. A. Stenhouse
Water closet seat..... C. Williams
Water closet seat..... F. W. Kingsbury
Water closet tank..... F. W. Kingsbury
Water cooler stand. Collapsible..... J. C. Hyton
Water heater..... W. Kane
Water or other liquids. Effecting the destruction of pathogenic organisms in..... P. G. Griffith
Water purifying and filtering apparatus. Electric..... J. A. Hyle
Water tube boiler..... F. Z. Sherer
Wave motor..... F. Starr
Weed exterminator..... E. F. Cameron
Weeder..... A. McRae
Well jack. Oil..... J. W. Rhoades
Whiffletree hook..... J. McCrelland
Windmill..... M. V. Hartong
Windmill..... R. L. Longley
Wire stretcher..... A. Miller
Wires or filaments. Making refractory metallic..... H. C. Parker et al
Woodworking machine..... F. W. Greene
Wrench..... J. W. Hielscher
Wrench..... R. H. Anderson
Writing machine..... E. B. Hess

DESIGNS.

Advertising stand..... H. E. Ellsworth
Belt..... M. Isenstein
Buckles. Bale for trace..... A. Madra
Fabric. Knit..... E. H. Brown
Frame..... 2 pats. G. H. Rice

Rug..... H. C. White
Shield..... W. C. Codman

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Advertising device..... O. N. Moore
Air containing dust. Device for purifying..... J. L. Palons
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Air. Purifying..... J. M. Dieterle
Alarm device. Electric..... J. F. O'Neill
Amalgam. Apparatus for the manufacture of reducing..... H. P. Ewell
Amusement device..... L. Moran
Animal trap..... J. A. Ward
Axle. Pressed steel..... R. S. G. Lane
Axle skein..... C. O. Wilder
Axle suspension for motor vehicles. Driving..... G. R. Greuter
Axles. Body support for..... T. J. Lindsay
Bags, satchels, purses, &c. Fastening for handles of..... H. B. Welch
Baking powder making machine..... H. M. Brook
Baling press..... S. J. Webb
Barrel..... J. F. East
Batteries. Automatic engaging and disengaging device for dynamo and storage..... O. Bohm
Battery binding post..... G. H. Cove
Bearing. Ball..... A. Riebe
Bearing. Ball..... J. F. Springer
Bed..... F. G. Gale
Bed..... N. S. A. E. Myers
Bed. Davenport..... C. A. Jones
Bed. Invalid..... E. C. Mead
Beds. Head and body rest for..... L. C. Frickey
Bedstead corner fastener..... M. G. Merritt
Belt support. Conveyor 2 pats..... C. Rouse
Bent wood corners. Making..... A. Worsfold
Billiard cues. Apparatus for shaping the ends of..... F. W. Schroeder
Binder..... A. Faifer
Binder lock. Loose leaf..... A. I. Risser et al
Binder. Temporary..... L. M. Morden
Binder. Temporary..... G. C. Shepherd
Binder. Temporary..... W. S. Mendenhall
Binder. Temporary..... C. Whetham
Blacking and paste receptacle and attachment therefor..... M. Schuppe
Bolting cloth cleaner..... M. J. Bartlett
Book. Future sales record..... E. R. Smith
Book mark. Automatic..... M. J. Conter
Book with locking arms..... L. M. Morden
Boring machine. Double..... J. T. Towsley
Bottle stopper..... D. W. Whitaker
Bottles. Machine for applying capsules to..... E. W. Potts
Boxes. Machine for use in making wire bound..... J. J. Miller
Bracelet..... B. Peterson
Bracelet lock..... L. E. Sadler
Bracket..... R. Kent
Brake..... C. N. Frey
Brake..... H. C. Neale
Brake shafts. Holding and releasing mechanism for..... A. Miller
Bridle bit..... J. A. Fretwell
Briquet machine..... J. H. Curell
Brooder..... H. E. Keller
Broom. Dustless..... J. R. Price
Brush..... F. Graul
Brush. Fountain..... F. L. Brinn
Buckle. Garment..... A. F. P. Stenzy
Builders' stagings. Implement for dismantling..... J. L. Robert
Building block..... J. Aitken
Burial casket..... W. E. Schwartz
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Camera. Magazine developing..... L. Mandel
Can..... E. Eckart
Cap. Child's..... L. Steinthal
Car bracer. Fruit..... N. C. Ives
Car construction..... J. R. Cardwell
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Car draft and buffing gear or rigging..... M. A. Garrett
Car. Dumping..... C. E. Herman
Car end construction..... E. I. Dadds
Car. Gondola..... A. E. Ostrander
Car. Hopper bottom gondola..... A. E. Ostrander
Car. Passenger..... R. H. & M. E. Moore
Car step. Pivoted..... G. Hagberg
Car uncoupling mechanism. Railway..... H. T. Krakan
Cars. Making metallic sills for..... E. I. Dadds
Carburetor..... R. E. D. Parrott
Card. Resistance..... H. Sawyer
Card Score..... W. F. Connolly
Carding machine cleaner..... R. Couture
Carousel. Water..... W. D. Burke
Carpet cutter..... G. Gamston et al
Casein compound..... B. B. Goldsmith
Cell case machine. reissue..... G. W. Swift, Jr
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Center. Collapsible..... E. W. Utzler
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Chain fastening..... A. Specht
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Chair..... J. Barta
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Cigar cutter and lighter..... F. A. Widmann
Circuit breaker..... E. M. Hewlett
Circuit closer. Time..... W. S. Guthrie
Circuit controlling mechanism. Automatic..... H. G. Crawford
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Clasp..... A. H. Cohn
Cloth cutting machine..... J. B. Gury
Clothes drier..... C. Stneben
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Clothes rack. Folding..... D. Sherlock
Clover buncher..... A. C. Funk et al
Clutch..... W. A. E. Henrici
Clutch coupling. Friction..... H. H. Benn
Clutch. Friction..... R. Huff
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Coat hook. Locked..... A. C. Pegan
Cock. Basin..... H. Mueller et al
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Coke oven..... M. E. Rothberg et al
Collar. Fabric horse..... W. B. Estes
Colorimeter..... C. H. White
Column. Stave..... G. W. Loggie

Combination lifter..... J. B. Ott
Comminuted material. Feeder for G. S. Heath
Commutator brush and holder for dynamos and the like..... J. A. Mialand
Concrete and metal structure..... J. W. Linree, Jr
Concrete block machine..... H. K. Burrill
Concrete brick machine..... J. Carlen
Concrete columns. Apparatus for constructing hollow..... F. Locher
Concrete columns. Mold for constructing hollow..... F. Locher
Concrete walls. Apparatus for constructing..... C. Dietrichs
Conveyer..... C. W. Levalley
Conveyer..... F. R. Willson, Jr
Conveyers. Tripper or deliverer for belt..... B. Morton
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Conveying apparatus..... J. H. Gilman
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Cooker. Steam..... N. N. Chase
Cooking utensil cover..... P. F. Gaenzle
Core molding machine..... U. G. Augustine
Corn sheller..... W. Bayley
Corset clasp..... C. H. Cunningham
Cotton boll opening machine..... W. I. Lowe
Counter. Foldable..... S. Soda
Crane and the like. Floating..... A. Bode et al
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Crystallization apparatus..... A. L. Marshall
Cultivator..... N. B. Yingling
Cultivator..... G. E. Barrett
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Cultivator. Hand..... G. H. Yarbrough
Curtain fixture. Adjustable..... J. J. Kiser
Curtain or shade. Window..... E. T. Bell
Curtain pole..... J. Perry
Curtain rod..... A. R. Snyder et al
Cutting implement..... A. B. Bennett
Cyanid process..... H. B. Goetschius
Damper regulator..... D. F. Morgan
Dental swage..... J. W. Dickey
Dentifrice..... F. P. Barnard
Derailment guard..... A. Anderson
Derrick..... J. W. Stolkrantz
Display holder for windows..... S. Golombek
Display stand..... C. T. Jackley
Displaying and vending device..... C. L. Maloney
Ditching and grading machine. Automobile..... M. G. Bunnell
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Door lock..... J. Sliga
Door opener..... A. & W. Kirchner
Door operating mechanism..... F. Ditchfield
Door securer..... E. R. Fuchs
Doors and tracks therefor. Roller support for edgewise movable..... A. E. W. Wyeth
Draft apparatus..... T. W. Hackle
Draft appliance..... J. J. Jernone, Jr
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Draft equalizer..... J. A. & J. J. Fisanigan
Drawer guide..... O. B. Starkwather
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Drill columns. Foot plate for..... A. D. Kenyon
Driving and reversing mechanism..... F. Snow
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Drum. Drying..... E. Vial
Dry separator..... W. N. Beach
Dust collecting systems. Branch pipe valve for..... W. E. Allington
Dye and making same. Yellow red..... G. Engi
Egg carrier..... J. W. Denmead
Electric circuit breaker..... S. B. Freiberg
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Electric heater..... N. N. S. Matcovitch
Electric induction battery..... H. E. Willis
Electric motor controller..... S. Sparrow
Electric time switch for beacons..... R. P. Nelms
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Electric wires. Tool for testing the currents in..... A. Scheibler
Electrical circuit protective apparatus..... H. P. Davis et al
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Electromagnet..... T. M. Walsh
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Elevator..... G. F. Steedman
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Embossing machine..... C. A. Gonzenbach
Emulsions. Homogenizing..... G. Knick
End gate..... J. P. Hansen
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Engraving machine..... R. A. Lienhard
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Eraser..... E. Faber
Extension table..... J. B. Lisee
Eyeglasses..... J. D. Lewis
Fabric containing haircloth. Making..... G. Goldman
Fan..... W. A. Tomison
Fare register..... C. E. Gierding
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Feed water heater..... O. L. Stump et al
Fence post..... E. R. Harris
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Fence post..... N. J. Schaefer
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Fibrous material drier..... C. E. T. Scribner
Filtering element. reissue..... K. Kiefer
Fire door releasing device..... C. Lamareaux
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Firearm. Box magazine..... T. C. Johnson
Firearm. Breech-loading..... O. F. Mossberg
Fish line reel..... W. E. Marhoff
Fishing tackle..... J. B. Tuttle
Flame furnace..... A. Proser
Flasks. Eye and pin for..... G. Downing
Fluid motor..... C. L. Wilkins
Flushing tank..... F. Findeisen
Forging machine..... M. M. Morrison
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Fulcrum. Reversible..... C. E. Bauer
Furnace charging apparatus..... 3 pats. E. H. Messiter

Furnace..... W. R. Wills
Furnace draft regulator..... G. H. Scharf
Furnace grate..... C. J. Dorrance
Furnaces. Smoke consuming attachment for boiler..... W. H. Colein
Gage of measuring device..... H. C. Knowlton
Game..... J. T. Grant
Game apparatus..... R. W. Piper
Game or puzzle..... W. L. Bedell
Garment fastening..... K. Pelew
Garment hanger..... C. B. Hotchkiss
Garment supporter clasp..... G. E. Prentice
Gas burner..... J. Doorenbos
Gas controlling device..... R. N. Oakman
Gas generators. Single removing mechanism for acetylene..... J. D. Tejada
Gas. Manufacturing producer..... W. H. Adams et al
Gas ports. Apparatus for regulating..... R. N. Oakman
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Gear. Change speed..... A. W. Wigglesworth
Gear. Transmission..... C. H. Brooks
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Gearing. Variable speed..... W. R. May
Glass articles. Apparatus for manufacturing..... J. H. Croskey
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Glass blown bottles. Implement for forming lips on..... A. W. Hutchins
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Gold extracting and saving apparatus..... J. A. Coombes
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Hair tonic..... E. N. Sheldon
Hammer and means of operating same. Power..... H. B. Stocks
Hammer drill..... W. Prellwitz
Harrow..... F. Geron
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Harvester. Beet..... C. Dusseau
Harvester cutting apparatus..... J. A. Rodman
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Hay rake attachment..... E. T. Elliott et al
Head block..... A. Burns
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Heat interchanger..... J. B. Speed et al
Heel plate..... R. Merrick Jr., et al
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Hinge..... F. Shersmith
Hoist. Fluid actuated cushioned..... G. F. Steedman
Hoist. Regulated..... G. F. Steedman
Hoisting engine..... A. E. Norris
Hoof trimmer..... P. A. Jensen
Hopper. Traveling..... W. J. Patterson
Horn. Amplifying..... M. Steiner et al
Horse releaser..... A. E. Frommel
Horseshoe..... E. Adam
Horseshoe pad..... A. F. Martins
Horseshoe. Soft tread..... H. Paar
Hose and piping. Flexible armor for..... W. D. Wier
Hub attaching device..... P. Le Sueur
Humidifier..... S. W. Cramer
Humidifier or air moistening apparatus..... S. W. Cramer
Hydraulic press..... F. Chailly
Hydrocarbon burner..... E. Spencer
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Incubator alarm..... F. R. Harris
Indicator..... R. Maconochie
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Journal boxes. Oil saving device for..... C. E. Rood et al
Key fastener..... A. H. Puttcamp et al
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Knob attachment..... A. A. Page
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Last. Shoe..... J. F. Cavanagh
Launches and vehicles. Starting and controlling internal combustion engine driven..... M. W. Hanks
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Liquid receptacle..... 2 pats. E. C. Webb
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Milk machine..... L. B. Stevens
Milling machine holder reissue..... H. Vaughan
Mine hoists. Signal and alarm attachment for..... B. T. Reilly
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Mold..... W. P. Earnheart
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Mouthpiece. Antinicotin..... J. Souheur
Mower attachment..... A. Theel
Nail puller and band cutter. Combined..... M. A. McMillan

Nut lock..... C. M. Thompson
Nut machine..... F. Lackner
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Ore concentrating machine..... H. C. Holthoff
Ore concentrator..... reissue J. W. Pinder
Ore concentrator..... reissue H. P. Taylor
Ores. Extracting metals from sulfid..... R. L. Packard
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Pad holding clip..... K. Jelalian
Paper box..... H. L. R. Wolf
Paper box machine..... C. C. Davis
Paper box topping machine..... H. A. Bowen
Paper, cardboard, or other stock. Machine for cutting..... C. D. Bradt
Paper cutting machines. Paper folding attachment for..... J. Brannan
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Parcel carrier..... A. S. Bretherton
Pasteurizing system. Regenerative..... A. H. Reid
Pasteurizing system. Regenerative C. W. Reid
Patterns on pattern plates. Apparatus for locating..... R. Ruddy
Patterns on pattern plates. Assembling..... R. Ruddy
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Photograph modifier..... A. S. Thompson
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Piling. Metal..... J. R. Wemlinger
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Power transmission means..... K. Gulbrandson
Pressure gage..... O. Arnold, Jr.
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Printing press..... H. E. Westervelt
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Propeller. Hand power..... N. Johnson
Protective device..... M. Schultz
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Rail joint..... F. Teubner
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Railway frog..... C. A. Alden
Railway frog..... E. S. Hippey
Railway gate. Automatic..... W. Bengtson
Railway rail and chair therefor..... R. Morgan
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Railway signal. Elevated..... D. M. Pfautz
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Range determining device..... A. L. Bump
Range finder attachment..... K. O. Leon
Razor blade handle. Safety R. P. Cafferty, Jr.
Razor. Safety..... F. H. Arnold
Razor. Safety..... W. Schmachtenberg
Reamer..... M. Boof
Receptacle top fastener..... J. F. Haffey
Reinforcing bar..... L. Hunt
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Ribbon holder. Hair..... I. Becker
Ring..... C. M. Levy
Rock drill..... 2 pats. T. E. Adams
Rock drill. Hydrocarbon..... J. V. Rice, Jr.
Rock drill. Self-contained..... O. C. Duryea et al
Rock drills. Motor supporting harp for..... T. E. Adams
Rocking and reclining chair. Combined..... F. Lahm
Rocks, ores, &c. Apparatus for crushing, conveying, and cooling..... R. F. Wentz
Rod coupling..... C. A. Anderson
Roost. Chicken..... F. Kremer
Rotary drier..... A. Berg
Rotary engine..... A. H. Carpenter
Rotary shears..... J. Jungers et al
Routing machine..... S. G. Goss
Rule and bevel. Combination..... E. P. Johnson
Safety elevator..... J. Hart
Safety lock..... H. E. Pratorius
Sandpaper holder..... W. W. Williams
Sap extractor..... V. P. McVoy
Sash lock..... O. L. Durlinger
Scaffold..... C. E. Lillow
Scoop..... 2 pats. F. C. Howe
Screen..... W. S. G. Todd
Screw cutting tool..... E. E. Beck
Seal..... C. E. Whitmore
Sectional drier..... F. G. Wiseloge
Seeder. Beet..... G. H. D. Ross
Separator..... G. D. Hoppes
Sewers. Temporary retaining wall for use in the construction of..... M. P. Byrne
Sewing machine attachment. Blindstitch..... W. Arbetter
Sewing machine table attachment..... O. B. Starkwather
Sewing machine thread clip..... A. Wood
Shade or curtain fixture. Adjustable..... G. Beres
Shaft or tongue support for vehicles..... W. Niles
Sheep hook..... C. R. Buffington
Shelf. Rotatable partition..... T. Van Kannel
Show cases, &c. Coupling for converging ends of canopy standards for..... E. E. Earnshaw
Shoulder braces..... C. C. Armstrong
Shutter bower..... I. Wroblewski
Shutter construction..... J. Branchili
Signaling. Polystation..... W. W. Dean

Skins. Machine for applying liquid to..... W. B. Turner
Skirt supporter and waist retainer. Combined..... W. S. Brainerd
Sled runner..... J. Pedersen
Slitting machine..... M. McKinley
Smoker's pipe..... N. D'Espinoza
Smoking device..... R. E. King
Snow and ice melter..... R. Rickard
Soap dispenser. Liquid..... L. A. Falk
Sound box..... L. P. Valiquet
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Speed mechanism. Variable..... 3 pats. L. Thiel
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Spinning frame roll stand..... E. D. Libby
Spring structure..... E. O. Stotts
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Stacker. Hay..... W. D. McAtlin
Stacker. Pneumatic straw..... O. O. Bodvig
Stains. Composition of matter for the eradication of..... L. von Graeve
Stamp punching, dampening, and affixing apparatus..... P. Arnold
Stamps. Machine for subdividing sheets of..... J. N. Stacy
Stanchion. Automatic logging..... E. L. Summers
Steam boiler..... I. J. Ullensaker
Steam controller..... J. Fehrenbach
Steam joint..... G. R. Pride
Stereotyping..... S. A. C. Kristensen
Sterilizers to mouthpieces. Device for applying..... O. H. Savage
Still..... A. S. Carr
Still retort. Wood..... H. Copilovich
Stirrer..... I. W. Greenwald
Stock nursing appliance..... H. Krumling
Stocking..... A. F. A. King
Stoker. Mechanical..... 2 pats. W. H. Strouse
Stone saw..... J. S. Young
Stove and the like..... S. M. Neill
Stove. Combined heating and cooking..... J. I. Hamaker
Stove. Oil burning..... F. M. Reed
Stove or furnace fire pot..... R. A. May
Stud. Metallic..... G. A. Turbull
Switch contact for controllers and the like..... S. D. Black
Switch mechanism. Electrical..... H. F. Krantz
Switch stand..... M. W. Long
Switchboard..... W. D. Weir
Switching arrangement..... O. Rennert
Syringe..... R. C. Brookes
Tag for jeweler's use..... D. Goldsmith
Tag wiring machine tag feeder..... J. J. Engiert
Target..... G. Easdale
Telegraph and trolley pole..... T. P. Stanley
Telegraph relay..... W. E. Athearn
Telegraphic apparatus..... T. W. McKenzie
Telegraphy. Space. 2 pats..... S. Cabot
Telephone exchange system..... H. G. Webster
Telephone exchange system..... F. J. & J. Mersman
Telephone mechanism. Party line..... C. H. Wood
Telephone operator's switching device..... W. Kaissling
Telephone signal..... G. W. Schuessler
Telephone systems. Visual recorder for..... R. W. Shoemaker
Tennis racket..... S. H. Beard
Terpin hydrate..... L. H. Renter
Thawing device. Window..... M. Trautman
Theaters. Safety appliance for..... A. L. K. E. von u. zu Gilsa et al
Tie and rail fastener. Combined..... E. P. Bergman
Time recorder..... A. L. Jaynes
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Tire wires. Machine for inserting and withdrawing..... H. Paar
Tire wrapping machine..... C. E. Miller
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Tires. Vulcanized joint for vehicle..... W. F. Stearns
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Tobacco pipe..... P. A. Kenna
Tongue support. Wagon..... J. C. Lambert
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Toy..... P. J. Delzeit, Jr.
Toy automobile..... A. C. Cooke
Toy. Detonating..... J. C. Wood
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Trolley wheel..... J. A. Norton
Truck bolster. Car..... H. P. Field Jr.
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Tubing..... E. S. Coffman
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Turbine engine. Steam..... A. W. Jackson
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Typewriting machine..... H. A. Briggs
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Valve..... H. S. Pinkerton
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Valve for gas supply pipes. Automatic safety..... A. W. Jenczewsky
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Vehicle tops. Bow spacing clamp for..... M. M. Trout
Vehicle wheel..... G. W. Zwiebel
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Vending cigars from original boxes. Machine for..... G. O. Halvorson
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Wall structure..... W. H. Fisher
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Water purifying..... O. L. Stump et al
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Window tent..... 2 pats. W. E. Walsh
Windows. Device for removing frost, steam, &c. from..... J. C. Harmer
Wire drawing apparatus..... G. A. Paff
Woodworker's bench clamp..... F. Helm
Wrench..... H. M. Justen
Wrench..... J. D. Aupke
Wrench..... T. W. Harper
Wrench..... S. R. Griffin
Wrench..... J. C. Dufresne
Wrench..... O. B. Jordan
Wrench..... C. R. Rawdon

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Dish or cup..... H. A. Miner
Floor or wall covering..... A. Lee
Ink well and pincushion..... L. & E. C. Weidlich
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Musical instrument..... W. H. Pritchard
Rug..... F. A. Haas
Shield..... 2 pats. W. C. Codman
Sign. Illuminated..... L. K. Liggett

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Aerial system for mining purposes..... G. G. Schroeder
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Air brake for cars. Automatic..... W. J. Dankel
Air brake mechanism..... W. V. Turner
Air brake system..... F. B. Corey
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Animal trap..... J. K. Wedgworth
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Annunciator for hotel letter boxes..... F. Muschenheim
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Bait. Artificial..... L. P. Gibson
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Binder. Loose leaf..... J. C. Dawson
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Bolt anchor..... F. C. Palmer
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Book holder..... J. S. Dudley
Book. Sales..... H. P. Brown
Booklet or folder..... R. H. Garman
Bottle closure..... J. P. Nixonow
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- Building blocks. Mold and die for making... G. F. Fisher
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Coin counting machine... M. B. Rightman
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Counterbalance... W. Lewis
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Shock loader... F. Mart
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Show window corner post construction... R. H. Jones
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Sleigh. Kicking... O. A. Ritzman
Slung shot... J. E. Swetser
Spanner. Adjustable... A. G. Taylor
Spark arrester... A. M. Harris
Speaking tubes. Electric signal for... C. M. A. Costello et al
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Spittoon... G. Zweigle
Splice bars. Apparatus for the manufacture of... G. E. Thackray
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Steam boiler... W. Downey
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Step and seat. Automatically folding... S. Orr
Stocking supporting clasp... G. Devoll
Stone in imitation of marble or granite and the like. Manufacture of artificial... L. Lefranc
Stone plates, slabs, or tiles. Manufacture of imitation... reissue... L. Hatschek
Stone sawing machine... J. S. Young
Stove. Coal... C. T. McCarroll
Sulfur burner... C. E. Savage
Switch... E. L. Nugent
Tag. Laundry... W. J. Baker
Tank supporting means. Water... F. C. Smith
Target shooting. Black stop and receiver for... W. T. Alsop
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Teaching of fractions. Device for facilitating the... W. Koops et al
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Telephone... F. Edwards
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Telephone system. Secret service... A. K. Andriano
Telephone, telegraph and trolley wires. Sectional pole for... H. M. Sciple
Telephones. Listening apparatus for... W. W. Grigsby
Telescope. Prism... K. Martin
Tire. Adjustable wheel... S. F. Mudge
Tire protector... O. Kelly
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Tire retaining attachments. Locking device for... R. S. Bryant
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Tobacco plant bed burner... J. D. & H. F. Flowers
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Track sanding device... J. H. Hanlon
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Traction wheel... A. E. Glascock
Train ventilating apparatus... J. A. Shires
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Trolley... J. Tetlow
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Trolley head... O. Hoffmann
Trolley track... W. J. Sumner
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Truck. Locomotive... W. Dalton
Trunk harness... E. N. Buchanan
Trunk line. Incoming... H. M. Post
Tubular drill. Lubricating... W. E. Roeske
Tuning device. Stringed instrument... E. E. England
Turbine... J. G. Callan
Turbine. Elastic fluid... O. Junggren
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Turbine wheel... H. Keller
Turbines. Attachment of blades for... V. Gelpke et al
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Turbines. Means for securing buckets in... C. E. Little
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Type casting machine. Single... L. Schmidt
Type writer. Music... L. C. & I. F. Badeau
Type writing machine... C. W. Walker
Type writing machine... G. Swenson
Umbrella... C. S. Gurney
Umbrella locking device... B. Moses
Universal joint... A. R. & F. S. Welch
Valve... H. C. Farrell
Valve and tapping device. Barrel... R. Stock
Valve. Check... E. F. Wendelken
Valve. Cut off... S. Mucci
Valve for air brake systems. Pressure... W. V. Turner
Valve for mufflers. Cut out... A. S. Hamilton
Valve mechanism for turbines... J. G. Callan
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Vault... W. H. Hollar
Vehicle draft rigging... W. J. Drees
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Vehicle. Motor... E. R. Fouts
Vehicle wheel... W. E. Schneider
Vehicle wheel. Elastic... R. Schucke
Vehicle wheel. Motor and other road... F. Walton
Vehicles. Number transparency for... D. Lynch
Vehicles. Transmission gearing for motor... F. F. & E. S. Cameron
Velocipede handle bar. Cushioned... M. Rosen
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Ventilator... W. Scharnweber
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Wagon. Dump... C. E. Kaufman
Wagon. Dump... R. H. MacClernan
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Wagon rack... J. L. Hartnett
Washing machine operating mechanism... T. J. Winans
Water closet seat... R. B. Hepner

Water cooler..... M. F. Bates
 Water meter, Rotary..... C. A. Lockwood
 Water motor..... R. W. Howe et al
 Water treating and storing apparatus..... W. A. Powers
 Waters. Device for detecting subterranean..... A. Schmid
 Weather strip..... C. E. Saint Clair
 Weed and grass trimmer, &c..... O. Shidler
 Weeder..... E. Pearl
 Well drilling apparatus..... G. D. Loomis
 Wheels. Means for preventing slippage of traction..... R. Shipman
 Whip holder..... E. H. Morris
 Whip socket..... T. Armstrong
 Winding machine..... G. F. Atwood
 Wing operating mechanism..... E. M. Hartman
 Wire belt or rope. Flat..... J. Kast
 Wire fabric..... L. Swank
 Wort. Cooling..... H. E. Deckebach
 Wrench..... R. H. Legg
 Wrenches. Pipe jaw attachment to J. R. Hill

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Casket handle plate..... F. K. Allen
 Check. Identification..... A. S. Wiley
 Dental cabinet... 2 pats..... H. C. Gowran
 Fabric. Knit..... 3 pats..... E. H. Brown
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 Automatic brake..... J. N. Lawrence
 Automobile drive wheel..... J. C. Brennan
 Automobile dust guard..... N. Leidgen
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 Bag holder..... J. Brown
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 Battery containing cell..... G. H. Stout
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 Bed spring tightener..... G. W. McCall
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 Binder or holder for cards &c..... F. C. Storrs
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 Bracelet catch..... W. Wallenthin
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 Brick kiln..... C. K. Weller
 Brick. Means for making stone faced..... W. Lammensen
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 Car side bearing. Railway..... W. White
 Carburetor..... L. Anderson
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 Carriage bow support..... E. W. Gedding, Jr
 Carriages. Sleigh attachment for children's..... W. E. Kidder
 Cart. Refuse..... J. Ochsner
 Cattle guard..... J. Knowles
 Centrifugal separator..... E. W. Bromall
 Chair leg fastener..... W. L. Playman
 Cheese mill..... E. E. Miller
 Child's chair..... H. Linden
 Chuck. Drill..... W. H. Adams
 Churn dasher..... J. F. Bertram
 Cinder mill..... W. W. Sly
 Circuit closer..... E. S. Clayton
 Circuit panel. Multiple..... H. T. Paiste
 Clothes line apparatus..... G. A. Demarest
 Clothes line reel..... J. P. Thorn
 Code or friction..... N. W. Baechle
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 Concrete walls. Constructing..... V. S. Vaughan
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 Copy holder. Stenographer's..... A. B. Red
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 Cotton chopper and cultivator..... J. Franklin
 Cotton gin attachment..... G. W. Long
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 Crane. Gauntree..... G. A. True
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 Dental flash press..... J. F. Hardy
 Dental plugger..... S. G. Perry
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 Desk. School..... J. P. Garber
 Die feeding mechanism..... E. Einfeldt
 Direct acting engine..... G. D. Hunter
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 Display hanger..... R. O. Doughty
 Dividers. Center for..... G. E. Perry
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 Drafting apparatus..... T. F. Williams
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 Dress shield fastener..... S. A. Duncan
 Drier..... C. W. Schwartz, Jr
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 Drop flask..... W. H. Greifenhagen
 Dust Separator for apparatus for removing..... D. T. Kenney
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 Fishing line reel..... C. W. Smith
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 Flash boiler..... H. Lemp
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 Fluid forcing apparatus..... E. Richter
 Fluid pressure suction apparatus..... E. S. E. von Lindenstamm
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Toy J. H. Sharrett
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Issued January 29, 1907.

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Belt guiding and tightening mechanism
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Belt shifter T. J. McVey
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Food. Cattle W. F. Warren
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Heating system. Steam T. F. Dexter

Continued in March Number.

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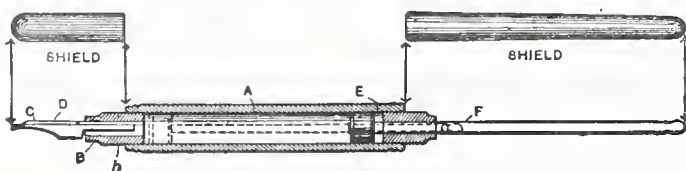
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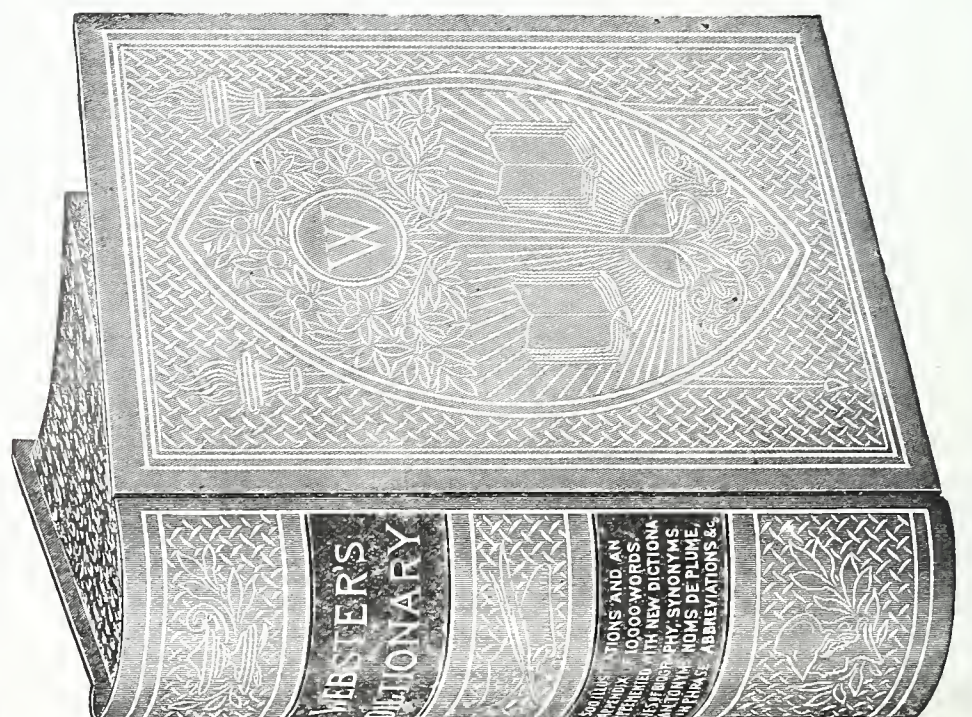
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THE TELEPHONE THAT TALKS.

AFTER wireless telegraphy, it would take a good deal to surprise the world; but the talking telephone, or telegraphone as it is generally known, deserves to be ranked among the wonders of science. When its invention was first announced, a few years ago, physicists and electrical experts were much interested. Sir William Preece declared that it marked an era in the investigation of the molecular character of all magnetic and electric operations. Marconi, Tesla, Lord Kelvin and others bore testimony to the extraordinary perfection of the "record and talking telephone." Then, for a period, little was heard of it by the public; but in the meanwhile the inventor, Valemar Poulsen, who is known as the Danish Edison, has been developing it and making it practical, so that it is a smoothly working piece of office machinery, for which the demand has already far out-run the supply. An American company has been formed to control the invention, which promises to make as many fortunes as were made by the Mergenthaler typesetting machine.

The telegraphone, it is predicted, will soon take the place of the stenographer, and no business or professional man of the future will think of writing his own letters. The machine is so constructed that it performs five different functions: it receives dictation, reproduces it, reproduces it at a distant point, the machine being under control at that point; it records conversations between two persons over the commercial telephone lines without in any way interfering with the operation of those lines; and it records automatically, in the absence of the subscriber from the office, messages coming over the line during such absence. The machine being under absolute automatic control from the ordinary function of the telephone line, the ringing of the bell starts the apparatus; a signal is sent over the line to the party talking, the message is taken down and it then stops automatically. As many business transactions are carried on over the telephone, it is claimed that this machine will be used to make records

of orders, etc., which will be filed away as letters are now.

So far as the untutored observer can see, there is nothing about the mechanism of the telegraphone to account for its performances. In a phonograph, it is easy to follow the movements of the steel pin that scratches its way over the wax cylinder, or traces a devious path in the grooves of a permanent hard rubber record. There is nothing so obvious about the telegraphone. The voice is recorded in

wire or across the disc, and they are clean again and ready for further use. The record may be retained indefinitely if desired.

The principle of operation is the same in the wire and disc machines, the main difference being that with a mile or two of fine steel strands, compactly wound on a spool, the capacity is greatly increased. A single spool of wire allows for half an hour's continuous dictation.

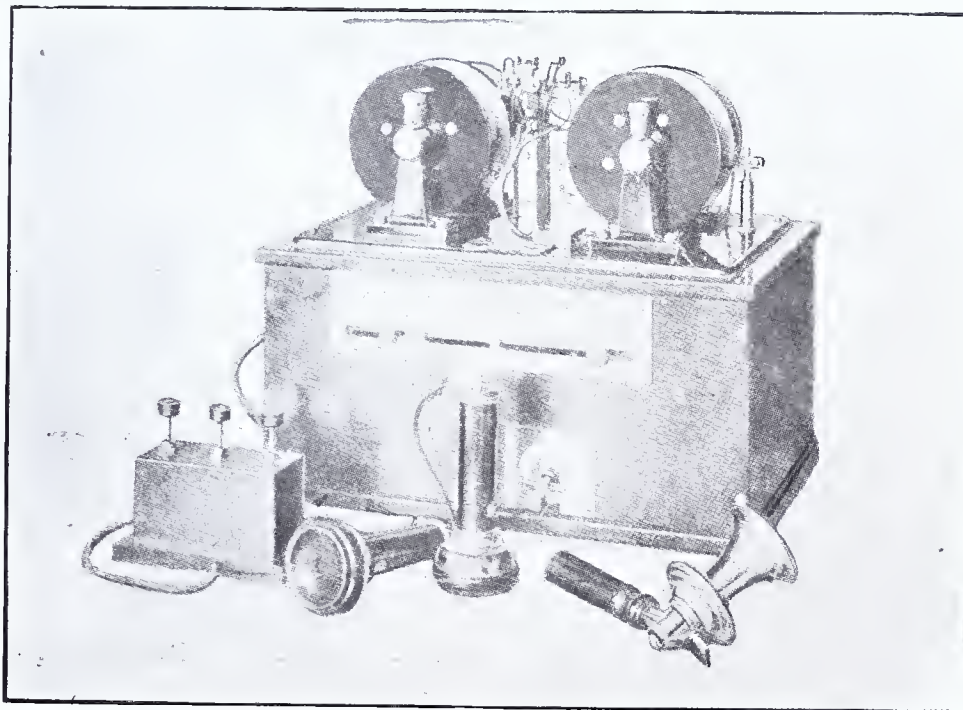
For correspondence purposes, the

see the possibilities of the telegraphone as a piece of office equipment. By connecting it with the telephone, a word for word record of all that comes or goes over the wire is made. If there is a dispute over an order to buy or sell stocks, the telegraphone record of the customer's voice shows what his instructions were. The advertising department of a daily newspaper, where many orders are received by telephone, and where misunderstandings are frequent, uses a telegraphone to make a magnetic transcript of everything that passes over the wire. In this way the one weakness of the telephone as a means of communication—that it keeps no record—is eliminated.

There is already a scheme on foot to equip a large hotel so that guests in their rooms, by using the telephone, can be placed in instant connection with telegraphones located in the typewriting room of the hotel, dictate letters and have them delivered ready for signature within a few minutes. The same plan has been suggested for a New York office building, providing means for quick dictations to machines located in the central typewriting establishment. The steel discs used are so light that they can be mailed for two cents, if one wishes to send a letter or a speech and have it delivered in his own voice at some distant point.

The telegraphone, it is claimed, has a broader field and a greater future than any one of those great industries, the telephone, the telegraph, the typewriter, or the phonograph, because it renders a telephone conversation as tangible and as safe as a written contract. It supersedes the phonograph in the office and in the home; it is a wonderful saver of time, a great convenience, and an insurance against error, both for the correspondent and the typewriter.

Several offices in the New York financial district are so equipped that every word spoken in one of the rooms may be taken down by a telegraphone, noiselessly but industriously eavesdropping in the vicinity of the unwary caller.



the form of electromagnetic impressions upon a thin steel disc or wire, (see cut) one hundredth of an inch in diameter. There is not a scratch, indentation, or mark of any kind to indicate that the disc has recorded anything. But start the reproducing mechanism going, pick up the ear piece, and the apparently blank record gives forth the remarks that have been made with a distinctness that is startling. There is no scratching sound, the words coming from the machine as clearly as from a human throat. The faintest whisper, or even heavy breathing is recorded and reproduced in the same way. To wipe out the record, all that is necessary is to draw a magnet over the

beauty of the telegraphone is that the typewriter operator can transcribe at any distance from the recording instrument, that is, any distance covered by the scope of the telephone. There is no carrying about of records or cylinders. All the typist need do is to take up his end of the connecting wire, press a button, and proceed to put into type the words that come through the receiver from the machine, which may just as well be a hundred miles, as ten feet away. Or the machine and operator may be in an isolated room, and the dictation carried on over a wire from another office. One push button starts the machine, another stops it, and a third one reverses it.

Wall Street brokers were the first to

ELECTRICAL PROGRESS DURING 1906.

IN summing up the progress made in the electrical industries in the year just closed, there is but little of a striking nature to record. Events which have taken place within twelve months are too recent to be viewed in the proper perspective. The full significance of certain happenings can not yet be determined, while other events, which at the time they occurred attracted considerable attention, seem now of less importance. This condition confronts any one attempting to outline recent industrial progress, for while he may be able to point out the general condition to-day and contrast it with what it was a year ago, and to indicate what particular features seem the most interesting in each branch, the nearness of these events is apt to exaggerate the details and partially mask that growth which is of true significance. Another difficulty in any such review of industrial development is the setting of exact dates. Few inventions are merely the result of inspiration: they are generally of slow and painful growth; and, while a generation hence may be able to look back and say that such and such a year was significant on account of a certain discovery or invention, happenings not so far back are viewed more as steps in a general advance than as departures along a new path.

The year just closed was noteworthy, so far as the electrical industries are concerned, for prosperous business conditions. On all sides shops were busy turning out orders, and, in fact, found it difficult to fill all those which they secured. The amount of business done was larger than in previous years, and not only was the growth along the old paths, but there was a branching out in new directions. Electrical methods are spreading rapidly into all industries; they are fast becoming the means by which industrial processes are carried out.

To run over briefly the various branches into which the electrical industry is somewhat arbitrarily divided, it is natural to mention first the telegraph. There has been no great change in this field so far as the older methods are concerned. While the telephone is becoming more and more a competitor, the telegraph companies in this country can show a healthy increase in business. No change has been made, of particular importance, in the methods of telegraphy, but the machine systems, which have been tested more fully during the year, in some cases seem to have given satisfaction. The introduction of printing telegraphs is, however, taking place very slowly. The putting into service of a number of single-phase, high-voltage railway systems proved that these are detrimental to neighboring telegraph and telephone wires, and brought this forward as an important problem now confronting the telegraph engineer.

The radio-telegraph systems have grown encouragingly, but the chief use is still between ship and ship, and ship and shore. Most of the progress

during the year was in developing details and devising new and improved appliances. One of the most important of these—at least, if it comes up to the promise held out—is the devising of means for producing continuous waves of high frequency. Valdemar Poulsen has adapted the singing arc to this purpose, but even this application is not new, although the first successful use of it was made during the year. Others have been working in the same direction, with some success.

An important event in the radio-telegraph world was the Berlin conference, held during the fall. All but one or two of the civilized nations sent delegates to this, and a set of rules was drawn up which will tend to increase the facilities for the exchange of messages.

In the telephone world the most striking feature was the increase in the use of the telephone, which has been maintained and even accelerated. This is true both of city and country. The large companies are pressed to install all the instruments that are called for. It has been estimated that there are in this country nearly 7,000,000 telephone instruments now in use. There has not been any particular noteworthy change in the apparatus used, but a goodly number of telephone engineers have been devoting their attention to improving the apparatus. More attention is being given to the automatic systems today than formerly, but one can not look for early condemnation of the entire manual system. An intermediate step will undoubtedly be made should the automatic system eventually prove to be the better.

Two systems of wireless telephony were described and tested during the year, by Ruhmer and Slaby, respectively. The latter succeeded in conversing over a distance of twenty miles or more.

The electric lighting industry has had a most prosperous year. The feature in this work which attracted the greatest attention was the endeavor to increase the use of electric current. The companies individually made greater efforts to increase their sales, and a general plan of co-operative action was put into force. The increase was considerable, but it is yet impossible to state how much of this was due to the prosperous condition of the country, and how much to more energetic solicitation. No important developments occurred in power-house practice, but the interest in new and improved forms of illuminants was unabated during the year, and was even increased by the production of several new lamps. One, the tungsten lamp, is particularly noteworthy, not only on account of its high efficiency and promise of good performance, but because of its method of preparation. The filaments are pressed from a paste produced by reducing the metal to the colloidal condition. Another, called the "Helion," is formed by depositing silicon on a carbon filament. Its effi-

ciency is said to be one watt per candle, and the life is long. A field of work allied to electric lighting is that of illuminating engineering. This received an unusual amount of attention during the year, following the formation of a society for this purpose.

Electric traction may be taken up as the next division chronologically, though, of course, the electrochemical industries date back to the production of primary batteries and the use of electro-plating. The latter industry, however, attracted but little general attention until later. The electric traction has grown rapidly since it first demonstrated its reliability. It has always been one of the most important fields of electrical application, and has attracted the greatest amount of public attention. It has now reached a stage where it becomes necessary to divide its field of application, although it is impossible to draw a hard-and-fast line. On the one side is the street railway system. On the other is the introduction of electric traction on steam railroads. Between the two divisions we have those city lines serving the purpose of street railways, but operated as a railroad. These are the elevated lines and the subways, on which trains of several cars are run. On the street railway branch the equipments have not changed, except where the individual switch system is being used in place of the old drum controller. The advantage is the greater reliability and ease of repair, and the ability to run cars in trains, as the system is adapted to multiple-unit control. A number of roads have been equipped with the single phase, alternating-current system, but we can record here nothing of development or improvement.

In the railway field an event of importance was the starting of electric trains on the New York Central electric zone at New York city. This was done in December, a few trains being put on and run in between the regular steam trains. Other steam roads are busy equipping certain sections of their systems electrically, evidently with the idea of trying out the new method with a view of introducing it on those sections where local conditions make the change desirable.

Another significant feature of the year was the drawing together of independent electric lines in the Middle West, whereby traffic arrangements were brought about. This will facilitate travel on these lines and make the roads more dangerous as competitors of the steam roads. On the other hand, certain steam roads sought to protect themselves against such competition by acquiring the electric lines in their territory.

It is usual to consider hydroelectric development and electrical transmission together, as they are mutually dependent. The utilization of our water powers has gone on steadily and surely. The tendency is toward larger generating units because of their economy. Considerable interest has been shown in the hydroelectric work going on and proposed at Niagara Falls, anxiety being ex-

pressed in some quarters lest the beauty of the falls be damaged. Practice in high-tension transmission, which as yet does not go above 60,000 volts, shows a tendency toward standardization for that pressure. All electrical transmission lines, for whatever purpose, are now built more substantially than before and auxiliary devices are designed to withstand more severe service.

An interesting announcement recently made was the organization of a large company to utilize the waste coal heaps at the mines in Pennsylvania by means of electric generating stations there, and transmitting the power to distant cities.

In the electrochemical and electro-metallurgical industries, much progress has been made in developing methods, but descriptions of these are not usually made public: they are treated as trade secrets. The trend of work may be followed to some degree by watching the patents granted. It appears that most of these industries are in a prosperous condition, since enlargements are common.

Investigation is going on rapidly with the high temperatures produced in the electric furnace, but although encouraging reports of its use for producing iron and steel are made, it has not yet—in this country at least—been applied for this purpose. New materials are continually being produced which were formerly chemical curiosities. The difficulty is that, in general, there is no demand for the new products, although certain of them possess properties of much importance.

The primary battery is in about the same condition it was a year ago, while with respect to the storage battery no far-reaching change has been made, although much work has been done in improving the details of the battery itself and its auxiliary appliances.

Although leaving the electron theory until the last, it might properly be given a leading position. A large part of the energy devoted to physical research is confined to electrical or allied fields. The radioactive phenomena have been followed enthusiastically, but probably with not as much energy as before. This field is being left to a small number of men who have done distinguished work in it. A feature here was the suggestion that actinium might prove to be an intermediate product in the production of radium from uranium, which is supposed to be the parent element.

The electron theory, proposed by Lorenz, has proved valuable in predicting phenomena, and this, in addition to the clear conception it gives of electrical action, has brought it into popularity. It is now becoming common for investigators to explain their results in terms of this theory—*Electrical Review*.

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To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for THE INVENTIVE AGE, which publishes a list of all patents issued each month, and the current decisions of the courts in patent, trade-mark and copyright matters. The low subscription price and the character of the publication entitle it to the support of all the inventors of the country.

NEW BOOKS.

BOILER WATERS.

Scale, Corrosion, Foaming

By WM. WALLACE CHRISTIE,

Price \$3.00.

A book having for its object to furnish steam users with information regarding water, its use, and troubles arising from the use of water and remedies that may be applied; the gain being more efficient generation of steam. The work gives elaborate analysis of different kinds of water, showing the properties and impurities. Boiler scale receives careful attention. The relative value of one water to another, it is pointed out, may often be measured by its scale-forming propensity with a given water. Purify this water, and all boilers come nearer a uniform value per unit of heating surface. There are 77 illustrations, giving interesting examples of corroded tubes and sheets; feed water heaters; water softening plants, and fuel-economizers. Softened water, the author explains, is water which has been freed from the salts of lime and magnesia, iron and aluminum. It cannot produce scale or corrosion, and many railways and other industries find it economical to establish several plants for softening water because of the greater duration of the life of boilers. On account of the efforts of the Railway Masters' Mechanics Association, real progress has been made in this direction and the same line of work has been taken up by manufacturers and industrial corporations.

An interesting chapter is devoted to oil, and a new advantage for the steam turbine is pointed out. In most steam engines, the author says, the exhaust steam contains lubricating oil; and if the steam is condensed and returned as feed water, this oil may cause serious corrosion in the boiler. In the turbine, no oil gets in the steam passages. A surface condenser can be used in connection with it, and the exhaust steam be returned to the boiler as pure feed water, without the necessity of maintaining oil separators. The use of a steam turbine would result in a boiler plant of minimum size and a much greater life in the boilers themselves, which latter benefit can only be fully appreciated by those who have had troubles from the oil required to lubricate "oil fed" engines.

D. VAN NOSTRAND COMPANY, NEW YORK.

ELEMENTS OF GAS ENGINE DESIGN.

By SANFORD A. MOSS.

Price Fifty Cents.

This little book is a reprint of notes accompanying a course of lectures delivered at Cornell University in 1902, and of articles from the "American Machinist", "Machinery" and "Power", with additions. In view of the fact that there is a growing tendency towards the wider utilization of the gas engine, this work is especially timely. The author has presented, in condensed form, all of the fundamental principles with which a designer of gas engines should be familiar. A complete exposition of the elements only of all subjects of interest to the designer, is attempted; and no effort is made to go into mathematical or constructional details. It is assumed however, that the reader is familiar with the general features of the gas engine. The work includes an outline of the physics and chemistry of the engine and a discussion of fuels; the action of the cylinder, with the method of finding the

size of cylinder for a given power; and the principles of gas engine construction. The last chapter gives rational formulas for most parts of a gas engine, with constants derived directly from modern American practice—all conveniently arranged for the designers use.

D. VAN NOSTRAND COMPANY, NEW YORK.

THE SEVEN FOLLIES OF SCIENCE.

A Popular Account of the most Famous Scientific Impossibilities and the Attempts which have been made to Solve them.

By JOHN PHIN, Illustrated.

Price \$1.25.

Although this work conveys much scientific information, it is as interesting as an novel and will be widely read by the general public; especially as the author uses the plainest language and avoids the use of mathematical formulae. Mr. Phin has given a simple account of problems which have occupied the attention of the human mind since the dawn of civilization and which can never lose their interest. In these days of almost miraculous progress, he says, it is hard to realize that there may be such a thing as a scientific impossibility. He has therefore endeavored to show where the line must be drawn.

The first question the reader will ask, of course, is what are the Seven Follies? The author enumerates Squaring the Circle; The Duplication of the Cube; The Trisection of an Angle; Perpetual Motion; The Transmutation of Metals or Alchemy; The Fixation of Mercury; The Universal Medicine and the Elixir of Life.

As additional follies, he notes the Alkahest or Universal Solvent; The Perpetual Lamp; Palingenesy; and the Powder of Sympathy. He also devotes a few pages to paradoxes, illusions and marvels, such as the fourth dimension, Can a Man Lift Himself by the Straps of his Boots? etc. These apparent contradictions to known laws of nature are easily explained when the fundamental principles which govern every case are understood. The problems presented, while of interest to every one, will also, in some cases, be of actual practical importance; for although we no longer have alchemists or seekers for the elixir of life with us, such will-o-the-wisps as squaring the circle, and perpetual motion still attract much attention.

D. VAN NOSTRAND COMPANY, NEW YORK.

THE STEEL SQUARE AS A CALCULATING MACHINE.

By ALBERT FAIR, Illustrated.

Price Fifty Cents.

This little book deals with a number of difficult problems in all branches of mechanics that may be solved with the common steel square without the need of calculation or of elaborate diagrams. It is intended, the author declares, not for graduates of technical schools, but for ordinary workmen and for beginners.

Although there are in the market several treatises on the steel square, there is none which explains the principle upon which the tool works, and unless the workman understands these principles he is liable to make the most curious mistakes. To many boss mechanics, some of the simplest problems here given are new and wonderfully interesting as well as practically useful. The fact that these problems are not generally understood is shown by the extraordinary blunders which sometimes appear in books and magazine articles on mechanical subjects. The author has therefore used the language of the shops instead of the precise terms of the mathema-

tician. The explanations are full, clear and so simple that any intelligent boy can understand them and put them in practice.

The Industrial Publication Company, New York.

THE WALSCHAERT LOCOMOTIVE VALVE GEAR.

A Practical Treatise on the Walschaert Valve Gear, with the history of its Development and Evolution into the valve gear of the present day.

By W. W. WOOD.

Price \$1.50.

The valve gear is the principal part of any engine, and the cumbersome Stephenson link motion that has been used in this country for 50 years is being replaced by the lighter and more accurate valve gear of the Walschaert type. Mr. Wood, in his capacity as air-brake instructor, has received many requests for information concerning this new style of valve gear—invented many years ago; but, through sheer conservatism, never taken up in America until the force of combined circumstances compelled its adoption.

The number of books devoted to the Stephenson link motion is legion; but this is the first given wholly to the subject of the Walschaert valve gear. There is now a steady tendency towards the introduction of this gear, as illustrated by the fact that at the St. Louis Exposition, the heaviest engine in the world (shown in a recent edition of the INVENTIVE AGE) as well as one typical of a class renowned for swiftness—the De Glehn compound—both used the Walschaert gear.

It usually requires years of study for an intelligent man to understand the principles of the common-link motion; but with the aid of this little volume the engineer can readily become familiar with the new valve gear.

THE NORMAN W. HENLEY PUBLISHING CO.,
132 NASSAU STREET, NEW YORK, U. S. A.

PRACTICAL LETTERING

With Original System for Spacing; Complete Spacing Guide; Analysis, etc.

By THOS. F. MEINHARDT, Illustrated.

Price Sixty Cents.

This is a practical work for the beginner, draftsman, engineer, sign painter, stone cutter, engraver, etc., showing a rapid and accurate method of becoming a good letterer with a little practice. It is the first book devoted exclusively to spacing, and was written because of the need of instruction on this subject. It is obvious that the most elaborate lettering of an expert will not produce a pleasing effect unless the space between the ever varying shapes of the letters in the group is harmonized by trained eyes. Hence a complete spacing guide was the problem to be solved by the author. The plain and invariable principles governing the variations in space are taught in clear and comprehensive language.

A feature of the work is that it provides the facility to determine the exact length of an inscription and the height of the letters best suited to cover the room at command, before the work is started. In other words, the letterer knows the extent of the room for the desired inscription, and a simple calculation determines the exact spot where the first letter should start and the last letter end, with even margins front and rear. Much unnecessary sketching is thus avoided, and the absolute accuracy of the system will produce the desired effect.

THE NORMAN W. HENLEY PUBLISHING CO.
132 NASSAU STREET, NEW YORK, U. S. A.

Walking Upon the Water.

The recent sensational performance of Captain Oldrieve, in walking down the Mississippi river 1500 miles in 40 days, to win a bet of \$5,000, has drawn general attention to water shoes and similar devices. Never since the early part of the eighties, when Capt. Paul Boyton, attired in a rubber suit inflated like a pneumatic tire, floated down the Ohio River, has any man performing feats on the water aroused so much interest as Captain Oldrieve. Those unfamiliar with water sports are inclined to look upon his achievement of wave walking as a modern miracle, but there is really nothing wonderful about it, except the courage and endurance necessary to so prolonged a trial. The moccasins worn by Oldrieve resemble small canoes. They are made of cedar, are three and a half feet long by six inches wide, and the depth is the same as the width. At the bottom, sides and heel they are perfectly square, and are slightly pointed at the toe like a canoe or a wooden shoe. Near the center is a place for the feet. The wearer, before donning the moccasins, incases his feet in heavy rubber boots which reach to the thighs, thus protecting his legs from the water, and after placing his feet in the moccasins—which fit tight—he lashes over the boots a rubber bandage which practically makes the moccasins water tight, although at times it is impossible to prevent water entering them. As the performer walks on the water, the moccasins sink below the surface a distance of three or four inches, and he propels himself with a stroking motion, something like skating, although it is obvious that it requires much more exertion. The walker at times resembles a man floundering along in mud from which he cannot entirely lift his feet. After one becomes accustomed to this novel foot-gear, however, and develops his muscles sufficiently to enable him to make progress, he can soon walk with ease on still water.

Devices for walking on the water have for years attracted the attention of inventors, and it is said that the idea appealed to General Grant, with results that came near costing the country one of its most noted presidents. When he was a boy he conceived the design of tying an inflated hog bladder to each great toe, imagining that he could keep the bladders in place under his feet and so make them serve as buoys in his progress over the water. But as might have been expected, the bladders promptly upset him, and he had to be rescued.

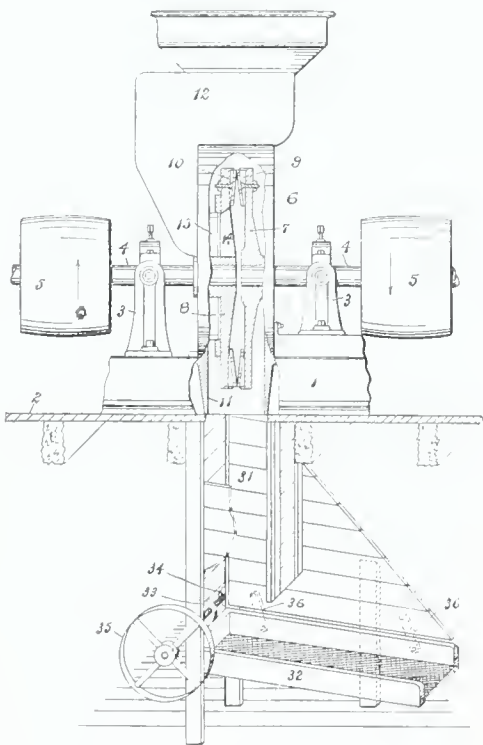
A member of the life saving crew at Charleston, Mass., has invented water shoes of another design, shaped like boats, of about the length of snow shoes but covering the foot like huge goloshes. The inventor says that he got his idea from the way a duck uses his foot, closing it in, drawing it forward and spreading it out when striking back, so beneath the boat like shoes he has placed valves that work like the duck's foot. Whatever may be said as to their general practicability, the inventor has become an adept in using them, and all of the crew of which he is a member are able to wear them. It is said that they can take long or short steps, turn quickly around, stand still, or drift with the current at will. The shoes have even been used by the crew, it is reported, in effecting rescues. The wider employment of these shoes might mean the introduction of a new form of pastime, (not to speak of their more serious uses) and races on the water would prove an exciting contest.

CLEVER NEW PATENTS.

Shredding Scrap and Waste Leather.—
Magazine Hammer and Hatchet.—
Boy's Wagon.—Securing Fish Hooks
to Trot Lines.—Cook Stove.—
Printing Type.

Shredding Scrap or Waste Leather.

Heretofore in shredding or reducing scrap or waste leather, great difficulty has been experienced because of the fact that the material is often pulverized, and frequently the friction and heat produced sets fire to the product of the mill. Mr. George E. Sovereign, of Pottersville, N. J., has devised and patented an apparatus for, and method of, shredding leather, which results in a product of a long fibrous character, the mechanism being so arranged and constructed that it will act upon the leather gradually, avoiding the clogging of the parts, and effecting the separation of the fibrous material from the granular particles. He has furthermore secured protection on his method of operation, which consists in subjecting the desired material to a shredding action, conducting the material shredded away, and before packing or settling of the material again occurs, subjecting it to a separating and assorting action.

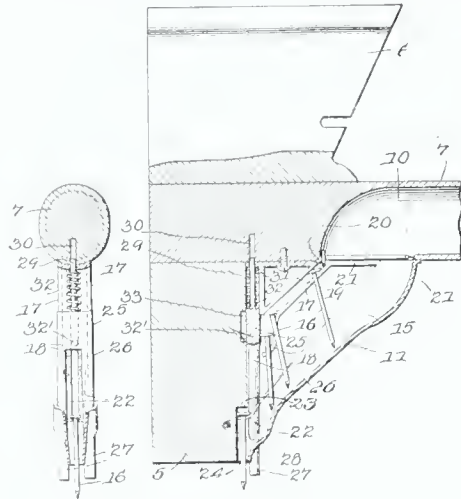


The machine consists of opposite annular shredding plates 7, having body portions provided with substantially parallel surfaces on their opposing sides. Radial ribs are located upon these faces, and increase in height from the center outwardly, whereby outwardly converging reducing surfaces are provided, and at the same time the ribs produce pockets. Annular ribs or flanges intersect the radial ribs, and means are employed for driving the shredding plates in opposite directions. This may be accomplished in various ways, for instance, the plates may be located on separate shafts 4, the outer ends of which carry pulleys 5 that are driven in opposite directions.

Magazine Hammer or Hatchet.

A magazine hammer, in which mechanism is provided for holding a quantity of nails and automatically delivering them one by one to the hammer head, has been devised by Mr. Daniel T. Vanlaningham, of

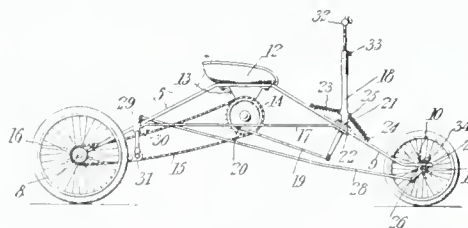
Youngstown, Mo. The handle 7 of the hammer is tubular to receive the nails or tacks, and at the juncture of said handle with the head is arranged the feeding mechanism. This consists of a pair of guideways leading to the operating end of the driving head, which is shouldered as shown at 23. The nails gravitate down the guideways, and their successive movement to a position beneath the shoulder 23 is controlled by a spring pressed plunger 25, having projecting legs 27.



Assuming the nails to be arranged as shown in the illustration, when the hammer is brought down, the point of the one projecting will be driven into the wood, and consequently when the hammer is raised, it will disengage therefrom, and can be driven home. As the driving operation is completed, the legs 27 will strike the surface, thus elevating the plunger, permitting another nail to feed downwardly, so that the nails will be successively driven without having to be manually held.

Boy's Wagon.

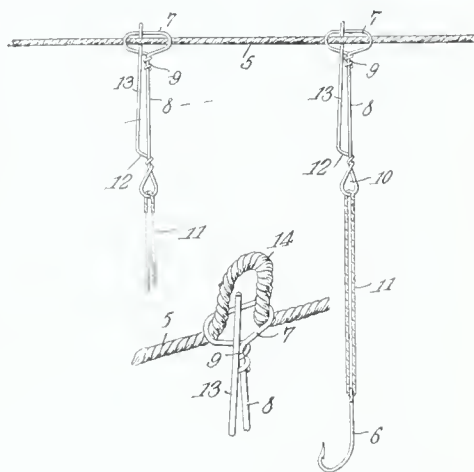
Boy's hand-propelled wagons are at present very popular, and one of the latest types is that patented by Mr. Alexander M. Bollinger, of Leechburg, Pa. The vehicle consists of a substantially triangular-shaped supporting frame consisting of converging rear bars 5, and a front bar or reach 9. The front and rear bars are bent or bowed upwardly and riveted or otherwise rigidly secured to the bottom of the seat 12. Depending from the seat is a hanger 13, in which is journaled a sprocket wheel 14, the latter being connected by a sprocket chain 15 with a similar sprocket wheel 16 mounted on the rear axle.



The lever 18 is fulcrumed between its ends, as shown at 21, and has a pitman connection with the sprocket wheel 14. Springs 23 and 24 serve to resist the movement of the lever in either direction. The lever, as shown, is provided with an adjustable handle bar 22. The front axle, which constitutes the steering means, has a foot rail or rod having a connection 28 that is connected to an arm 29 carried by a rock shaft 30. Depending from the rock shaft are brake shoes 31. It will be evident that the operator not only can steer the wagon, but can apply the brakes. These brakes, moreover, will be partially applied when making short turns, thereby avoiding any chance of upsetting the wagon.

Securing Fish Hooks to Trot Lines.

An ingenious device has been patented by Mr. Joseph B. Harris, of Branson, Mo., on improvements for securing fish hooks to trot lines, and the like. The suspension device or coupling is preferably formed of a single piece of wire, one end of which is bent to form an elongated loop 7 that receives the trot line 5. The wire is furthermore doubled to produce an eye 10 that receives the flexible loop 11 from which the hook 6 is suspended. The other end of the wire, as shown at 13, constitutes a shank, which interlocks with the loop 7 and the line 5 so as to maintain the device in position. In placing the suspension device or coupling in position on the trot line, a loop 14 is formed in the line and the latter inserted through the loop 7 and passed upwardly and over the free end of the locking member 13, after which a longitudinal pull is exerted on the line 5, thus causing the intermediate portion of the loop to bear against the adjacent end of the tongue 13 and effectually prevent accidental displacement of the suspension device.

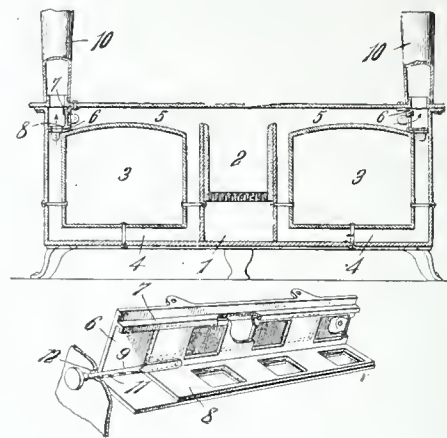


In order to remove the line, it is merely necessary to grasp the line at the loop 7 and elevate the same, so that the latter will clear the free end of the tongue 13, in which position the line may be readily withdrawn from the loop.

Cook Stove.

The cook stove shown in the accompanying illustration is the patented invention of Mr. William R. K. Stanford, of Sheffield, Ala. The principal feature of this stove is the construction of a damper which is located at the upper corners of the ovens, and which is so constructed that it will open or close the passages leading around and under the oven, or leading over the oven. The stove body 1 is provided with the usual fire box 2 and ovens 3. A heat passage 4 passes around each oven, and another heat passage 5 passes over the top of each oven. A backing plate 6 is located at the juncture of these passages, and is composed of leaves located at right angles to each other, one of the leaves being disposed at the upper

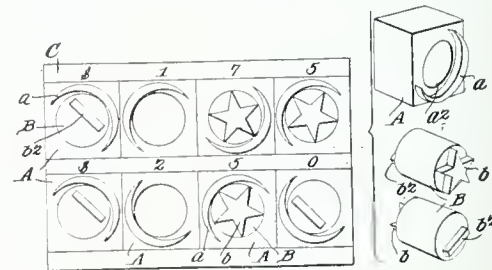
end of the passage 4, the other being arranged across the end of the passage 5. The leaves are provided with per-



forations, and the perforation of one leaf is staggered with relation to the perforation of the other. A damper 8 is slidably mounted on the backing plate, and as shown in the detail illustration, consists of angularly disposed leaves provided with openings that align with the openings in the leaves of the backing plate. Thus, when the damper is moved in one direction, the passageway beneath the oven is open, while the one over it is closed, and the movement in the opposite direction opens the upper passageway and closes the lower.

Printing Type.

Eugene B. Oswalt, of Tuskegee, Ala., has secured a patent on printing type, particularly adapted for use in marking the cost price, the selling price, or either or both on merchandise. The object is to provide a type in which practically indefinite permutations of the character of the imprint may readily and easily be secured, thereby rendering it possible for any number of merchants to use the same character of type, and yet leave each ignorant of the meaning intended to be conveyed by another. Each type consists of an annular body having a circular opening therethrough, and provided with a suitable character at one side of the opening to represent the numerals from "0" to "9," as well as the dollar sign. This constitutes



in effect a body element of a non-reversible character. A circular section or element is arranged to fit in the circular opening, and is provided on its opposite ends with other characters. It will be evident, particularly by reference to the accompanying illustration, that while the same characters can be employed, they may be combined in different relations so as to secure a great number of different designs or marks known only to the user of the type. The illustration shows two combinations which may be made.

PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

STREIT v. KAIPER et al.

(Circuit Court of Appeals, Sixth Circuit.
March 16, 1906. 143 F. R. p. 981.)

1. PATENTS—INVENTION.

An increase in the size of an existing device to more completely fulfill its purpose does not constitute patentable invention.

2. SAME—FOOT REST FOR CHAIRS.

The Streit patent, No. 668,268, for a foot rest for chairs, which slides on ways under the chair seat, and when not in use turns down on hinges against the front of the chair frame and becomes in appearance a part of the chair front, is void, for lack of patentable invention in view of the prior art.

LOCKE INSULATOR MFG. CO. v. LEY et al.

(Circuit Court of Appeals, First Circuit.
May 10, 1906. 143 F. R. p. 985.)

PATENTS—INVENTION—INSULATOR PIN.

The Locke patent, No. 493,434, for an insulator pin, is for a mechanical structure only, and as such is void for lack of invention.

MUNROE v. RITER & CONLEY.

Circuit Court, W. D. Pennsylvania. August 12, 1895. 143 F. R. p. 986.)

PATENTS—INFRINGEMENT—MANHOLE FOR BOILERS.

The Monroe patent, No. 339,998, for a manhole for boilers, having an integral flange and an internally applied cover with a circumferential groove therein for the reception of the flange, was not anticipated, and discloses patentable invention. Also held infringed.

MONROE v. ERIE CITY IRON WORKS.

(Circuit Court, W. D. Pennsylvania. March 5, 1906. 143 F. R. p. 989.)

1. PATENTS—INFRINGEMENT—MANHOLE FOR BOILERS.

The Monroe patent No. 339,998 for a manhole for boilers, held not anticipated, valid, and infringed.

2. SAME.

The Monroe patent, No. 446,151, for a manhole cover, held not infringed.

DUN et al. v. LUMBERMEN'S CREDIT ASS'N et al.

(Circuit Court of Appeals, Seventh Circuit.
January 9, 1906. 144 F. R. p. 83.)

1. COPYRIGHT—INFRINGEMENT—UNFAIR USE OF PUBLICATION.

The use of a complainant's copyrighted publication giving capital and credit ratings of business men generally by defendant, which published a similar book giving capital and credit ratings only with respect to the lumber trade, merely for the purpose of checking names which defendant had for any reason failed to get, or in a few cases to compare ratings where there was reason to question the accuracy of those obtained by defendant, the facts published by defendant having in every case been obtained by independent investigation, was a fair use, and not an infringement of the copyright.

2. SAME—GROUNDS FOR INJUNCTION—INSIGNIFICANT INFRINGEMENT.

A court of equity will not enjoin the publication or sale of a credit rating book containing many thousands of names, as an infringement of complainant's copyright, because defendant's agents or correspondents may in a very few cases have made an improper use of complainant's publication, but will remit complainant to his remedy at law.

BRADLEY v. ECCLES.

(Circuit Court of Appeals, Second Circuit.
February 8, 1906. 144 F. R. p. 90.)

PATENTS—PRIOR PUBLIC USE—THILL COUPLING.

The Haunan reissued patent, No. 11,260 (original No. 456,117), for a thill coupling, held void for prior public use for more than two years before the filing of the application of the original patent.

WILSON v. CALCULAGRAPH CO.

(Circuit Court of Appeals, First Circuit.
February 8, 1906. 144 F. R. p. 91.)

PATENTS—INFRINGEMENT—TIME RECORDING MACHINES.

The Hamilton patent, No. 424,291, claim 1, for a machine for recording measurements of time, and the Abbott patent, No. 583,320, for a calculagraph which embodies in a single machine the Hamilton device and one for recording the time of day, used specifically in timing long distance telephone messages, construed, and held not infringed.

J. L. MOTT IRON WORKS et al. v. F. W. WEBB MFG. CO.

(Circuit Court of Appeals, First Circuit.
February 26, 1906. 144 F. R. p. 103.)

PATENTS—INFRINGEMENT—WATER-CLOSETS.

The Chadbourne patent, No. 461,734, for an improved construction of the bowl and seat in water-closets, claim 1, construed and held not infringed.

DOWNES v. TETER-HEANY DEVELOPING CO.

(Circuit Court, M. D. Pennsylvania. February 23, 1906. On Rehearing March 13, 1906. 144 F. R. p. 106.)

PATENTS—INFRINGEMENT—INSULATION OF ELECTRICAL CONDUCTORS.

The Downes patents, No. 534,785 and No. 709,001, for an improvement thereon, both covering a process for applying asbestos insulation to electrical conductors and the resulting product, the process consisting in its essential features of brushing or carding the insulating material after it has been glued to the wire to raise a nap, laying it in one direction, and then compressing it to form a mat which is then coated with a waterproof material, construed, and held not infringed as to either process or product by the Heany patent, No. 740,131.

APPERT v. BROWNSVILLE PLATE GLASS CO. SCHMERTZ v. APPERT.

(Circuit Court, W. D. Pennsylvania. September 30, 1904. 144 F. R. p. 115.)

1. PATENTS—SUIT TO COMPEL ISSUANCE.

A suit by an unsuccessful applicant to compel the issuance of a patent to him under Rev. St. § 4915 [U. S. Comp. St. 1901, p. 3392], is not an appeal from the proceedings in the Patent Office or the decision of the Court of Appeals of the District of Columbia, but is one of original equity jurisdiction.

2. SAME—PRIORITY OF INVENTION—EVIDENCE CONSIDERED.

Evidence considered, and held to establish the reduction to practice by Edmund C. Schmertz of the process of making wire glass covered by the Appert patent, No. 608,096, prior to the issuance of the French patent, for the invention to Appert, and to entitle Schmertz to patents on his rejected applications covering such process and apparatus for practicing the same as against Appert.

3. SAME—LACHES—DELAY IN MAKING APPLICATION.

Delay by an inventor in applying for a patent after he has reduced his invention to practice for the purpose of perfecting it, or testing its practical value, will not constitute an abandonment or laches which will defeat his right to a patent where, from some unknown cause, it was not successful in operation, although it subsequently develops that the trouble was due to external causes not effecting the utility or successful working of the invention.

EDISON v. AMERICAN MUTOSCOPE & BIOGRAPH CO.

(Circuit Court, S. D. New York. March 26, 1906. 143 F. R. p. 121.)

PATENTS—INFRINGEMENT—KINETOGRAPHIC CAMERA.

The Edison reissued patent, No. 12,037 (original No. 589,168), for a kinetographic camera claims 1, 2 and 3, were not anticipated and disclose patentable invention in the means shown for imparting an intermittent movement to the tape-film while passing in front of the lens; but in view of the prior art such claims must be narrowly construed and confined to the specific feeding mechanism described. As so limited, such claims held not infringed. Claim 4 held void, as too broad.

MOSS v. McCONWAY & TORLEY CO.

(Circuit Court, W. D. Pennsylvania.
Feb. 27, 1906. 144 F. R. p. 128.)

1. PATENTS—SUIT FOR INFRINGEMENT—BILL.

A bill for infringement of a patent in order

to state a case must allege the facts which are essential to the validity of the patent under Rev. St. §§ 4886, 4887 as amended by Act March 3, 1897, c. 391, 29 Stat. 692 [U. S. Comp. St. 1901, p. 3382], and negative those the existence of which would defeat it.

2. SAME.

A bill for infringement is bad on demurrer where it fails to allege that the invention was not patented or described in any printed publication in this or any foreign country more than two years prior to the application for the patent, or whether or not it was patented in any foreign country, and, if so, that application was made within seven months thereafter for the United States patent.

3. SAME—ALLEGATION OF INFRINGEMENT.

A bill for infringement of a patent must charge the infringement of a material part of the invention to entitle the complainant to relief in equity.

4. SAME—MULTIFARIOUSNESS.

While a bill for infringement of two separate patents must show that the inventions are capable of conjoint use, it is sufficiently shown where one patent shows on its face that it is for an improvement on the invention of the other.

THOMSON-HOUSTON ELECTRIC CO. v. JEFFREY MFG. CO.

(Circuit Court, S. D. Ohio, E. D. August 5, 1897. 144 F. R. p. 130.)

1. PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

Where a patent has been sustained on a motion for a preliminary injunction, and the order affirmed on appeal, it comes before another court on a similar application as a sustained patent, and the ruling may properly be followed, in the absence of any contrary decision, unless there is some new question raised, and so far sustained as to make a prima facie defense against validity.

2. SAME.

Where the complainant has made a prima facie case for injunction against infringement, the right is not to be denied on the ground that the injunction would be inconvenient to defendant or seriously interfere with the success of his business.

HYGEIA DISTILLED WATER CO. v. CONSOLIDATED ICE CO.

(Circuit Court, W. D. Pennsylvania. March 2, 1906. 144 F. R. p. 139.)

1. TRADE-MARKS AND TRADE-NAMES—NAMES SUBJECTS OF OWNERSHIP—MYTHOLOGICAL NAMES.

The word "hygeia," used as a distinguishing name for a distilled water for such length of time as to identify the product of a particular manufacturer, may become a valid trade-mark.

2. SAME—INNOCENT USE BY ANOTHER—RIGHT TO INJUNCTION.

The innocent use of another's trade-mark, without knowledge of its prior appropriation, will not justify its further use after the fact of infringement becomes known; nor is the right to an injunction against such infringement defeated by the length of time of such use unknown to the proprietor, or by the fact that he has not, up to the time of suit, extended his trade to the locality occupied by defendant.

CUMMING v. BAKER & HAMILTON

(Circuit Court of Appeals, Ninth Circuit.
March 19, 1906. 144 F. R. p. 395.)

1. PATENTS—CONSTRUCTION OF CLAIMS—IMPROVEMENT PATENTS.

A patent for mere improvement on prior devices must be limited to the precise devices and combinations shown and claimed.

2. SAME—INFRINGEMENT—PORTABLE FORGE.

The Cumming patent, No. 386,771, for a portable forge, while valid, is limited by its terms to improvements in the form and arrangement of the several parts and the method of securing them together, and is not infringed by a structure which does not contain the new features therein shown and claimed.

O'LEARY et al. v. UTICA & MOHAWK VALLEY RAILWAY COMPANY.

(Circuit Court of Appeals, Second Circuit.
March 20, 1906. 144 F. R. p. 399.)

PATENTS—VALIDITY AND INFRINGEMENT—CONVERTIBLE CARS.

The O'Leary reissued patent No. 11,992 (original No. 664,890) for convertible cars was not anticipated, and discloses patentable invention in its essential feature, which is the means shown for storing inflexible

side panels or sash in the roof of a car without such material changes in its construction as to affect the public convenience. It also covers cars which are only semiconvertible in which such means are used. Claims 1, 10, 13, and 14, held infringed by cars constructed under the Brill & Buckingham patent, No. 709,073. Claims 1, 2, 6, 7, 8, and 9, held either invalid for lack of invention, or not infringed by such construction.

NEW YORK PHONOGRAPH CO. v. NATIONAL PHONOGRAPH CO. et al.

(Circuit Court of Appeals, Second Circuit.
March 7, 1906. 144 F. R. p. 404.)

PATENTS—EXCLUSIVE LICENSE—EQUITABLE RELIEF AGAINST BREACH.

Complainant as licensee of the exclusive right to use, exhibit and let phonographs and graphophones, and to sell appliances therefor within the state of New York from the owner of the patents therefor, held entitled to damages for breach of the license contract, and to an injunction against further breaches by the invasion of its territory by defendants who subsequently became the owners of the patents with full knowledge of such contract.

WAGNER TYPEWRITER CO. et al. v. F. S. WEBSTER CO.

(Circuit Court, S. D. New York. March 28, 1906. On Rehearing, April 16, 1906.
144 F. R. p. 405.)

1. TRADE-NAMES—USE—INFRINGEMENT.

Complainant manufactured and sold typewriter ribbons for the "Underwood" typewriter, the ribbons being contained in boxes bearing the words "Underwood Typewriter Copying Ink Ribbon manufactured only by J. Underwood & Co." Defendant also manufactured typewriter ribbons, using a star as a trade-mark and the words "The Webster Star brand," on its boxes, above which was the single word "Underwood." There was evidence that defendant's use of the word "Underwood" was solely to indicate that the box contained a ribbon of the proper size and on the appropriate spool for use in the Underwood typewriter, and not for the purpose of palming off its ribbons as of "Underwood" manufacture. Held, that defendant's use of the word was not unlawful.

2. PATENTS—DESIGN PATENTS—TYPEWRITER RIBBON SPOOLS.

The Manning design patent, No. 31,675, for a ribbon spool for typewriting machines is void; such a device not being a proper subject of a design patent.

3. SAME—INFRINGEMENT—RIBBON MECHANISM FOR TYPEWRITERS.

The Wagner patent, No. 650,438, for a ribbon mechanism for typewriters while it makes a ribbon spool an element of the combination does not make it a chief or vital part, but only an ordinary working part, nor is it singly a part of the invention, being common and necessary for all typewriters whether the patented mechanism is used or not. The spool not being patented, either singly or in combination with the ribbon, and being of trifling cost, is usually replaced when the frequent necessity arises for renewing the ribbon, and the owner of a machine equipped with the patented mechanism, being under no license restriction, may replace both ribbon and spool as a matter of repairs, without infringement of the patent, and a manufacturer, who sells the two together for such replacement, is not chargeable with contributory infringement.

SMYTH MFG. CO. v. SHERIDAN et al.

(Circuit Court, S. D. New York. March 31, 1906. 144 F. R. p. 423.)

1. PATENTS—INVENTION—BOOK-SEWING MACHINE.

The Reynolds & Jacobs patent, No. 435,613, for a book-sewing machine, by means of which the signatures are sewn together to form the book by independent lines of stitches located at such points in the back of the book as the requirements of each particular kind of book render necessary, was not anticipated, and discloses patentable invention; the machine being one of great utility and an advance on the prior art by reason of its adaptability to use on different kinds and sizes of books. Also, held infringed as to claims 3 and 15.

2. SAME—INFRINGEMENT.

Infringement is established, where, comparing the two machines, it appears that the several devices and elements of one perform substantially the same functions as those of the other, in substantially the same way to produce the same result.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Joseph Delancy, inventor: F. A. Wise, assignee. Bucyrus, O. Wrench.—The wrench covered by this patent is particularly useful for operating on round objects, such as pipes. The wrench consists of a stock having a tapered bifurcated head provided with serrated faces. The stock also has longitudinally disposed slots in its opposite sides, which slots extend to the bifurcation. A swinging jaw has a stem located and pivoted in the bifurcation of the head, the jaw being reversible. A leaf spring is secured to the stem and is adapted to be arranged in either of the slots, and a detachable keeper pin bridges the slots and is arranged to be placed across either slot over the spring. By this arrangement, a wrench is provided that has a powerful gripping action, and is not only reversible, but may be provided with interchangeable parts, so that its range of usefulness is greatly enlarged.

William M. Viser, Harrodsburg, Ky. Shears or Scissors.—The blades in their general outline, are of the ordinary character, and are connected between their ends by the usual pivot. One of the said blades, however, is provided with a recess in one face, through which the pivot centrally passes, this recess extending completely across the member and having overhanging flanges forming undercut guide-ways that are curved concentrically to the pivot. A projection is carried by the other blade and snugly fits in the recess, the projection being of equal width with the blade carrying it, and having outstanding flanges at its ends that are curved concentrically to the pivot and slidably fitted in the guide-way. As a result a pivoted connection is secured, which will prevent the blades from becoming loose, and thus will insure their proper co-action at all times.

William T. Washington, Harrodsburg, Ky., inventor; Wm. M. Viser, assignee, same place. Egg Beater.—This patent discloses an ingenious device of spoon-shaped type, capable of adjusting itself automatically to suit the shape of a dish, whereby the beater is adapted to operate effectively either in a deep or shallow dish. It consists of a handle, and a head or agitator movably connected at an intermediate point with the handle, and having a heavy outer portion, adapted to hold the head or agitator in alignment with the handle, when the parts are free to assume such position. The agitator head or handle, when placed within a vessel will fit flat against the bottom thereof.

John Rombach, Weston, W. Va. Pouch Transferring Means.—The invention covered by this patent, relates to improvements in mechanism for effecting the transfer of mail pouches between stations and moving trains. The primary object is to provide novel means for more effectually securing the exchange of the pouches so as to avoid danger of their falling beneath the wheels of the train, with the consequent destruction of, or injury to, their contents. Another object is to provide means which can be placed further from the car than those now in general use, need not be held by the mail clerk, and will not be a material hindrance to the escape of the clerks from the car in case of accident. The track side mechanism consists of an upright standard with upper and lower brackets secured to the standard and inclining toward each other. Spaced

rods are fastened transversely to the free ends of the brackets and extend beyond opposite sides of the same, the free terminals of the rods being out-turned. The car carrying mechanism consists of a supporting bar with an outstanding bracket carried thereby, and consisting of a body portion. Rearwardly extending pouch supporting fingers are provided, and angular brace rods connect the same with the bracket. A forwardly projecting arm is carried by the bracket, and pouch receiving jaws are disposed between the arm and supporting rod and are connected to the bracket. By this means, the pouches can be transferred from the station to the car, and from the car to the station in either direction, and with safety, regardless of the speed of the train.

Douglas M. Campbell, Houston, Tex. Bale Tie Fasteners. Two patents.—In the first of the two Campbell patents issued is disclosed a bale tie fastener which is capable of being stamped from sheet metal and so constructed that the ends of the band may be fastened or tied quickly and conveniently, and in a manner to utilize the expansion of the bale in securing the connection. The tie comprises a metal plate formed with parallel transverse end bars, and an intermediate inclined holding bar gradually tapered from its base to its outer end, one of the end bars being provided with a longitudinal slot adjacent to one side thereof and closed at both ends.

The fastener disclosed in the other Campbell patent is so constructed that the operation of applying the same consists in first fitting a band to a bale with the ends of the band overlapped. The overlapped band ends are then crimped simultaneously to form reversely formed loops, which will temporarily tie or interlock the band ends so that the crimping tool can be withdrawn and the hands of the operator left free to handle the fastener or retainer without danger of the crimp being drawn out, or the band ends disconnected by the surface expansion of the bale before the retainer can be applied. The fastener or retainer is then applied to one of the loops of the crimp, and a key is passed through the loop to effect a permanent interlocking of the band ends and retainer.

Cordean A. Rought, inventor: Fred. N. Schoonmaker, assignee, Lester-shire, N. Y. Curtain and Shade Fixture.—The curtain and shade fixture of the present invention is designed for supporting a curtain pole and a window shade, and it is capable of adjustment to obviate the necessity of trimming window shades. The device is provided with a fixed L-shaped member, having one of its arms extending outward, and provided at its other arm with means for securing it to a window frame. The outwardly extending arm is curved at its outer portion to provide a pole-receiving seat. The transverse attached portion receives an adjustable bracket, having spaced flanges to embrace the transverse portion and adjustably secured to the same. The adjustable bracket is also provided with an outwardly extending arm, terminating short of the arm of the fixed member, and provided with a bearing to receive a window shade roller.

Owen D. Anderson, Barnwell, S. C. Shutter Fastener.—The shutter fastener of this patent, which is designed to prevent burglars from either entering or escaping by a window, is operated by a removable key, and effectually prevents a window shutter from being surreptitiously opened from either the exterior or the interior. The device embodies a fixed catch or keeper secured to the window sill and having an interiorly arranged shoulder, and a hinged catch mounted

on the shutter and constructed to interlock with the fixed catch or keeper, and provided with key operated mechanism for engaging the shoulder of the fixed catch or keeper. The key operated mechanism is concealed within the device, when the parts are locked.

Albert B. Carter, Hazlehurst, Miss. Boll Weevil Exterminator.—The present invention relates to a boll weevil exterminator, adapted to be readily mounted on the beam of an ordinary plow, whereby the boll weevils may be killed at the same time the cotton is cultivated. It is capable of both vertical and lateral adjustment to adapt it to the width of the rows and the size of the plants. The device comprises a pair of receptacles, an adjustable support connecting the receptacles at the bottom and provided with a clamp for engaging the beam of a cultivator, and an adjustable brace connecting the upper portions of the receptacles. The receptacles consist of upright and horizontal portions, and are provided with doors, having upright and horizontal portions. These doors are constructed of wire gauze, the interstitial openings of which form passages for the insects.

Paulus J. A. Van Deinse, Greenville, Mich., inventor: The Gordon Hollow Blast Grate Co., Greenville, Mich., assignees. File Case.—It is often of vital importance, and very often of great advantage in the business world, to have the attention called to a certain matter on a certain date in the future, and lack of an adequate system for this purpose causes a considerable tax on the memory, and frequently involves failure to attend to an important matter at the proper time. The purpose of the present invention is to entirely relieve the mind of this burden, and to insure attention to matters at a proper date. The invention comprises a file case having an open front, fixed vertical partitions dividing the case into sections, the opposite sides of the partitions being provided with corresponding ways, removable partitions fitted in the corresponding ways of the several sections, and adjustable from one set of ways to another, the end sections having their removable partitions numbered in the order of the months of the year, and the removable partitions of the intermediate sections being consecutively numbered from 1 to 31, and removable drawers for closing those day compartments which correspond to holidays and Sundays.

William Kronenwetter, St. Marys, Pa. Folding Packing Box.—The present invention relates to that class of boxes that may be collapsed when not in use. It is the object to provide a structure which may be compactly folded, and has no detachable parts that are liable to become lost. The box is furthermore reinforced and strengthened, and is thus very useful for shipping purposes, inasmuch as it will stand rough usage. At the same time, it is compactly foldable so that it may be returned to the shipper in collapsed condition and at small cost. It is made up of foldable walls and movable covers. Reinforced strips are secured to the covers and are hinged at their ends to the walls, and other reinforcing strips formed of sections are arranged to extend in opposite directions across certain of the walls and be detachably secured thereto, said sections being attached to the covers.

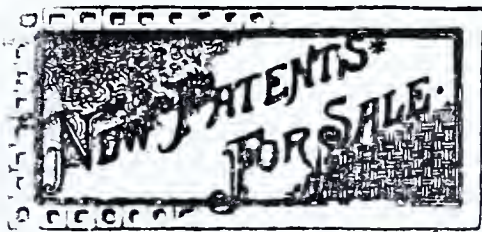
William Kronenwetter, St. Marys, Pa. Handle for Cross Cut Saws.—It is the aim of the present invention to provide a handle adapted to be readily applied to any ordinary cross cut

saw, and capable of securely gripping the same without liability of becoming loose through use. The invention comprises a rod having screw threads and provided with means for engaging a saw blade, and a cap receiving the handle, and provided at its lower end with an inwardly extending tube, and having an integral projecting flange, forming a flat exterior face for engaging the saw blade. The tube is provided at its inner portion with threads for engaging the rod, and it has a smooth lower portion, arranged to support the rod and terminating short of the inner or upper end of the cap, whereby the latter is adapted to receive a solid portion of the handle.

William A. Fuller, Marietta, Ohio. Brush and Broom Moistener.—The device of this patent, which is adapted to be quickly applied to, and removed from, an ordinary broom, is designed to contain, water, oil or an antiseptic solution, and is capable of enabling the discharge of the same to be controlled by the person using the broom, whereby a too rapid and undesirable discharge of the contents of the moistener is prevented. The device, which is adapted to discharge its contents both interiorly and exteriorly of a broom, comprises a reservoir provided at its upper portion with discharge openings, and having supporting hooks, forming discharge tubes. The openings and the discharge tubes are arranged to permit a free discharge of the contents of the reservoir, when the same is partially inverted, and the flow of the contents is cut off when the broom is in an upright position.

George Gamston and Harry Coward, Philadelphia, Pa. Carpet Cutter.—This device is designed to be used for cutting carpets to fit projecting portions and recesses of rooms, and it is adapted to accurately and rapidly cut a carpet at any desired angle. The carpet cutter comprises a table or support, an adjustable base pivotally mounted on the table or support and arranged to swing horizontally, and cutting means adapted to be arranged at different angles by the adjustment of the base or member. The table or support is provided with an arcuate series of perforations, and the base or member has a depending stud for engaging any one of the perforations. The knife for cutting the carpet is slidable on the hinged guide, which is adapted to swing upwardly and downwardly to engage and release the carpet, and the latter is prevented from accidentally slipping by means of spurs or projections carried by the hinged guide.

Albert B. Pratt, Lyndon, Vt., inventor; Our Husbands Mfg. Co., Lyndon, Vt., assignees. Fruit Picker.—The object of this invention is to produce a device adapted for picking various kinds of fruit, and capable of quickly gathering and transferring the same to a basket, or other receptacle, without injuring the fruit. The fruit picker is provided with means for preventing the cutters from coming in contact with the fruit, while placing the device around the same and while severing the fruit from the tree. The fruit picker embodies a pole, a frame having upper and lower substantially circular members provided with projecting loops, cutters fulcrumed on the upper member and having their outward movement limited by the loops of such member, bell crank levers fulcrumed at their angles on the loops of the lower member and connected with the cutters, and operating mechanism for actuating the levers. The frame is provided with projecting fingers, which support arched guards for preventing the cutters from coming in contact with the fruit, when the device is open.



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FOR SALE—Whole or part interest in my patent door and window fastener. Send twenty-five cents for sample and particulars. Address, H. E. Homes, Burlington, Vt. my

FOR SALE—U. S. Patent No. 837,285. Trap Hens Nest to trap hens, for keeping record of number of eggs laid during the year. For sale at a bargain. Address, Chowder & Wheeler, Bethany, Ill. my

FOR SALE or on royalty, or part royalty and part cash—Canadian Patent No. 103,071. A wrench that can run a nut on or off where little space for the handle to work machine wrench. Address, William A. Allen, Lecanto, Fla. my

FOR SALE on royalty—Patent No. 837,795, dated Dec. 4, 1906. Windmill for running both a pump and light farm machinery by using wire or hemp rope belt passing down center of mill around and over grooved pulleys. It will run smoothly. For particulars address, B. E. Cassell, Wyoming, Ill. my

FOR SALE—Patent No. 842,411, dated Jan. 29, 1907. Compound Wooden Structure. Adapted for use in making straight edges employed by paperhangers and others. Will not warp or crack. Simple and perfect. For particulars address, Oliver Messinger, Box No. 544, Sheridan, Wyoming. my

FOR SALE—The only thing of its kind. A carriage top spring of great merit for sale. Prevents broken and bent bows. Rests reclining "top" where bow is strongest. Simple, durable and exceedingly cheap. Patented Dec. 11, 1906. Write me for illustrations. A. G. Pame, Cripple Creek, Colo. my

FOR SALE—Patent No. 807,402, dated Dec. 12, 1905. Combined Key and Lighting Device. Address, J. L. Scanlan, Indianapolis, Ind. my

FOR SALE—Patent No. 762,352, dated June 4, 1904. Excavating Machine. For particulars address, J. L. Scanlan, Indianapolis, Ind. my

FOR SALE—U. S. Letters Patent No. 838,076, for Envelope and Stamp Moistener. Latest out. Always ready. For full particulars address, W. A. Brown, Brookhaven, Miss. my

FOR SALE—Patent for sale outright or for part royalty and part cash. Hatchet and Plane Combined. Patented in United States October, 1905, No. 800,646; in Canada March, 1906, No. 98,137. Address, D. M. Haney, Box 44 Sykesville, Pennsylvania. my

FOR SALE or on royalty—Patent No. 823,237, dated August 7, 1906. Safety Stirrup. Best thing of the kind ever invented. A money-maker for the manufacturer. Make me an offer. F. E. Miller, Silver Hill, W. Va. apr

FOR SALE—Patent of Oct. 2, 1906, No. 832,495. Reservoir Gate. For head of canal in river also. Size of stream never changes by water level rising or falling. Never clogs. Simple, cheap, and durable. For further particulars address, George A. Millett, Cedar City, Utah. apr

FOR SALE—Patent No. 838,965, dated December 18, 1906. Window-glass Fastener. Without the use of putty. Its easy to put on and its easy to take off, and the same taken off can be put back. For particulars address, James A. Douglas, Yates Landing, Ill. apr

FOR SALE—Patent No. 834,972, dated Oct. 30, 1906. Try-square. Enables the marking of two faces of the work simultaneously. Also permits marking of timber for square or plumb cut and for beveled cut. Blade of square can be used as a protractor. Every carpenter should have one. Will sell patent outright for United States and Canada. For particulars address, James Collie, Lake Linden, Michigan. apr

FOR SALE—U. S. Patent. Sure Catch Gate and Door Latch. Closing gate locks latch; no springs to break or rust out. No sagging. Hog-proof. Highly recommended by all who have them in use. A ready seller. Unlimited demand. Inexpensive to manufacture. A snap for right party. Address with stamp, J. B. Aikin, Wilmington, Ohio. apr

FOR SALE—Novelty companies can make money on my late patent. I have not time and money to push it. I will sell on royalty or outright. Address, A. A. Day, 43 Main Street, Brockton, Mass. mar

FOR SALE—A novel invention. Artificial Christmas Tree. Patent for sale at reasonable price. Photo and particulars address, E. C. Leonard, Thompson, Pa. mar

FOR SALE—Patent No. 829,330, dated August 21, 1906. Stubble-cutting Attachment. Greatest labor saving device ever invented. Every farmer should have one. For particulars address, James M. Greenshields, Binscarth, Manitoba, Canada. mar

FOR SALE or on royalty—Patent No. 832,052, dated October 2, 1906. Egg Beater. Can be made cheap. Send for drawings. For particulars address, Arthur Fritz, Canastota, N. Y. mar

FOR SALE—Patent No. 767,714, dated August 16, 1904. Hot Air Furnace. Has many points of superiority. Is simple, durable, and practical. Address, Frederick Warner, Gnadenhutten, Ohio. apr

FOR SALE—Patent No. 841,041, dated Jan. 8, 1907. Shaft and tongue support for buggies. Keeps them elevated when not in use; cheap and simple; quick and easy to apply. Applies to all buggies. Hitch up in half the time. No more stepping on shafts. Address, W. Nokes, Patentee, Montrose, Iowa. my

FOR SALE—U. S. Patent No. 836,214. Tree Cultivator. Price two thousand dollars cash. For particulars address, George B. Reeve, La Mirada, California. apr

FOR SALE—U. S. Patent No. 837,725. Skirt and Waist Fastener, issued December 4, 1906. Open to reasonable cash offers for state rights. S. P. Quigley, Ovid Center, N. Y. apr

FOR SALE—U. S. Patent No. 835,713, dated Nov. 13, 1906. Nail Box. Every time a nail is taken out it is ready for hammer. Handy thing when nailing laths or shingles. It is very simple. Can be made for 20 cents. Make me an offer. Address, John Schuster, R. D. No. 4, Algoma, Wis. my

FOR SALE—Patent No. 831,416, dated Sept. 18, 1906. Transmission Gear. Second to none of its kind ever invented. A money maker for the manufacturer. Address, John Chalmers, No. 25 Raymond Court, Bath, Maine. mar

FOR SALE—United States Patent No. 818,965. Painters' Ladder Support. Will enable workman to stand ladder on porch or any other roof, and is quickly attached. Address, R. E. Irwin, Ligonier, Pa. mar

FOR SALE—Patent No. 833,855, dated October 23, 1906. Cotton Chopper. Will sell for cash or royalty. A farm implement. Every farmer needs it. Can be made cheap. Address, R. A. Stuart, Mt. Gilead, N. C. mar

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WASHINGTON, D. C. MARCH, 1907.

The Condition of the Patent Office.

The report of the Commissioner of Patents for the year 1906, placed before Congress during the session just closed, shows the usual progress in the business of the Patent Office. He calls special attention to the remarkable growth of the work of the Office during the last seven years. The number of applications and caveats filed during that period has practically doubled, while the letters patents issued, and trademarks, prints and labels registered have increased by nearly 58 per cent. This enormous expansion of work, within two-thirds of a decade, corresponds to the growth in business throughout the country. The increase, to quote the Commissioner, follows very closely the increase in the number of employes in manufacturing establishments in the country, and the distribution of these applications among the different states and territories is very nearly proportional to the number of employes engaged in manufacturing in such states and territories. These facts show that the patent system is very closely related to the manufacturing enterprises of the country, and it is believed that this system has materially aided the manufactures of the country, and that its prosperity is closely connected with theirs. For this reason, the Commissioner urges such liberal treatment of the Patent Office by Congress as to permit its adequate development, especially in the matter of increased working force.

A certain number of additional employes was provided for by Congress during the previous session, and the new clerks and examiners entered upon their duties in July last. As a result of this enlarged corps, the Commissioner declares that the work of the Office is in better condition than for years. It has long been notorious that the work was seriously in arrears, especially in certain divisions. In view of the huge number of applications daily handled, it is not surprising that there should be some delay in the consideration of

cases: but when an application was forced to wait five months before it was taken up for the first examination, and when similar dilatory treatment of amendments caused the case to drag on for a year or two before it was finally allowed, the public was justified in protesting. But within the last year, there has been great improvement in this direction, thanks in part to the increased clerical force, and in part to the fact that the Office has been working overtime. As a result of these efforts, in most of the divisions the amended cases are now taken up for action within a few weeks, the average time being 25 and a fraction days. The new work is handled, in twenty-nine divisions of the Office, within one month after filing, and the remaining ten divisions within two months. Not a single division has exceeded the latter period. This shows great advance; but while the zeal of the Office is to be commended, there is still room for improvement. There is no reason why applications should not be considered within a day or two after they are filed in the Office. This is the way work would be conducted in any of our large manufacturing establishments, and the Patent Office—more than any other department of the Government—should be managed on such a business-like basis.

To bring this about, however, it will be necessary not only to further enlarge the corps of assistants, but to increase the salaries of the Examiners. This matter was treated in the INVENTIVE AGE of last month, and has been brought before Congress by a committee of patent attorneys. It is impossible to maintain an efficient service within the Office unless the frequent resignations of skilled Examiners can be prevented. There were 32 of these resignations last year, and as the vacancies had to be filled by inexperienced men, the work naturally suffers. After the assistant Examiner has been in the Office for several years, and has become trained in his special line, he has inducements to resign which are more flattering than any the service can offer. The temptation to accept employment with practicing attorneys, or with large manufacturing establishments which have patent departments, is too strong to be resisted.

The Commissioner declares that the inducements to enter private work are more often presented to Patent Office Examiners than to any other group of technically trained men in the Government service. The obvious remedy is to so increase their salaries that they would be willing to remain at their desks. Sixty years ago, the pay of a Principal Examiner was \$2,500, at that time equaling that of a Representative of Congress. The latter's salary has, very properly, been much increased in the last half century; the Examiner's has remained stationary. It would certainly seem that some of the large surplus which now rests in the United States Treasury to the credit of the Patent Office might be used in improving the conditions which would inure to the general benefit.

Fire-proof Cars.

The railroad car of the future is to be as safe as engineering science can make it, according to a recent declaration of one of the officials of the Pennsylvania Company. All the equipment for passenger service of this road will hereafter be made of steel, and fireproof. The necessity of providing non-collapsible, absolutely fireproof cars for the New York tunnel has simply hastened the day of this transformation, and experiments with new steel cars are now being made. Not only will these have steel frames and boxes, but wood will be eliminated from all the details of construction. This will involve the expenditure of a large amount of money, but no money will be spared to remove danger from fire and collision.

About a thousand unburnable cars are to be ready when the New York tunnel is completed. This will mean some 500 Pullman cars, and the first all-steel sleeper ever built is now being constructed. Railway officials and travelers in general are keenly interested in the result of the experiments with the new passenger car. Other so-called steel coaches have been built—especially for the New York Subway—but they have been only partly of steel. The first car to be built anywhere in which the main object has been to secure the elimination of every particle of combustible material is one that the Pennsylvania officials are now trying on local runs. The new car weighs 103,550 pounds against 84,900 for the standard wooden coach, but it is found that the added weight very greatly reduced the vibration and adds to the comfort of the passengers. No inconsiderable part of the additional weight is due to the great burden involved in carrying storage batteries and battery boxes. All the new cars are to be lighted by electricity, and the Pennsylvania will in future carry no gas-illuminated cars of any kind into its New York tunnel. The electric wires in the new cars are all thoroughly insulated in heavy metal conduits, thus increasing the safety.

Motive power officials believe that the weight of the present car can be still further reduced, although it will always be heavier than the wooden coach. The experimental car has a small quantity of combustible material, and in the effort to remove this absolutely, it may be necessary to add weight in slight particulars.

The new coach is absolutely non-collapsible. It could stand any load or any collision. Its hidden frame is like a cantilever bridge, suspended on the trucks as piers. This safety against telescoping is secured by the use of enormous steel girders, the principal feature in the body of the car being a central box girder 24 inches wide by 19 inches deep, extending throughout the length of the coach.

In the past, railroads have found that when trains collided and the body of one car rose above the body of the next, there was a tendency for the underframe of the first car to sweep the superstructure of the second car off its underframe. In the new

equipment this is prevented by the extraordinary strength in the door and vestibule endposts, which are, of course, of very heavy rolled steel.

To show something of the effort made to make this car absolutely fireproof, it is only necessary to state that the flooring throughout the car and platform consists of an imitation of stone, spread while in a plastic state over the steel plates of the car. The framing above the windows is composed of steel plates, the doors are composed of steel plates pressed into shape imitating the wooden doors used in other cars, and filled with cork to deaden the sound. The roof is constructed of composite boards covered with copper sheathing. The inside lining consists of composite boards covered with fireproof paint. The seats are of steel frame, covered with plush that has been treated so as to render it, too, fireproof. The foot-rests are likewise of steel. In the experimental car, the arm rests are of wood, but tests of various metals are being made in the effort to secure a non-combustible material which will not be cold to the touch.

A coupler arrangement of a new type, stronger than anything yet used, has been designed for this car to avoid any possibility of breakage and the resultant parting of trains.

In planning this car, no expense was spared to build a coach which should provide the greatest possible strength: a steel framing which could not be affected by fire; an inside lining which should be absolutely unburnable, and at the same time would not conduct heat or sound.

The company has also been making elaborate tests to ascertain the effect of the temperature of the atmosphere on steel, as compared with the old wooden car. It is found that in hot weather, the difference is very slight, and that the steel car shows a decided inclination to cool off more rapidly than the old wooden coach.

Mining Under the Sea.

Mining underground would seem to be dangerous enough, but working beneath the depths of the sea, with the constant possibility that a million tons of water might be precipitated upon the heads of the toilers, appears to be tempting Providence. And yet many veins of coal have been followed far below the bed of the ocean. In Nova Scotia, for instance, there is a coal mine whose total area under water covers not less than sixteen hundred acres. This colliery, which is located on Cape Breton Island, was the first in North America to mine coal from beneath the ocean. The seam of coal averages six feet in thickness, and is of excellent quality. The angle of dip or inclination seaward is five degrees, or about one foot vertical in twelve horizontal. The workings have been carried on for nearly thirty years, and are now distant from the shore line 5,800 feet to the dip. At this point the overhead cover of earth is 1,140 feet thick, with some 40 feet depth of water above it. It is reassuring to learn that no sea water has as yet found its way into the mine. This immunity from leaks is probably due

to the presence in the superincumbent strata of twelve beds of fire-clay or underclay of a total thickness of 39 feet, as well as to the numerous beds of shale. The subsidence of the overhead strata caused by the removal of a bed of coal six feet thick would probably under these conditions soon choke itself, so that there would be no further actual motion of settling of the strata for more than, say, 100 feet upwards. Above that point the elasticity of the beds of shale and fire clay mentioned would prevent any rupture. Fire clay when brought into contact with water soon forms a soft clay resembling putty, and impervious to water. Already, we are told, over five million tons of coal have been taken out of this submarine area.

BIG RED CROSS PRIZE.

\$10,000 to Be Awarded Inventor of Best Apparatus.

The prize annually distributed by the international committee of the Red Cross Society from the funds of the endowment left by the late Empress Augusta Feodorovna of Russia has this year been awarded to the Dutch committee.

For the first time since the foundation of the society, a prize of \$10,000 will be awarded to the inventor of the best apparatus for the transport of the wounded from battlefields. A jury chosen from the delegates attending the next international conference of the Red Cross, which will take place in London in June next, will select the prize winner.

Pies by Machinery.

The demand for pie proverbially understood to be most eager in Pennsylvania, has become so general and insistent that it has been found necessary to call upon the resources of machinery in order to meet it. A pie machine is now on the market—and working full time—which turns out from sixteen to eighteen pies a minute. The apparatus is 18 feet long and 20 feet wide, and it takes one man and three boys to operate it. An electric motor furnishes the necessary power, and the forming dies are kept warm by means of gas. Over the machine is suspended a huge tank, capable of holding enough cooked apples, pumpkins, sweet potatoes, or any other filling desired, for four hundred pies. An agitator in the tank is kept constantly in motion, to prevent the material from blocking the outlet. After the paste for the crusts has been properly mixed, it is weighed and cut into pieces of the prescribed size for a dough divider. A tray full of lumps of dough for bottom crusts is placed at one end of the machine, and another tray containing lumps designed to make the top crusts, at the other end. At the rear is a stack of plates, automatically fed by a ratchet.

In operation, a magnetized arm swings around, picks up a plate and places it on a die made to receive it. A piece of dough is placed on the plate, and the next movement brings it under a die which rolls it into shape to form the lower crust. Then

the fruit is deposited from the tank, and the plate moves forward. By this time another lump of dough has been flattened out and stamped with an initial, such as A for apple or L for lemon, while an automatic bellows blows a puff of flour over the dough to keep it from sticking. The filled pie and this upper crust are then brought together, and adjusted, if necessary, one operator being stationed here. Then the covered pie comes under the edging die, which cuts off the scraps, and the pie passes forward on an apron leading to the oven. The machine is said to work so accurately and satisfactorily that others are being constructed.

Explosive Letters.

Among the latest devices employed by the anarchists to carry death are explosive letters. A letter is a harmless looking object, but it can be made as dangerous as a bomb, and can with much greater certainty be made to reach the person intended to be injured. The postoffice authorities of European countries are well informed on the subject, however, and are on the lookout for such deadly missives. Not long ago, the Russian postal authorities discovered among the mail addressed to three of the government ministers, three explosive letters—one for each—and all on the same day. It was evidently intended to make a general removal on that particular date.

One of the most convenient of explosives for the perpetration of these criminal attempts is fulminate of mercury, the employment of which is restricted in comparison with that of dynamite and chlorated powders, which are much more widely known. The reason for this is that fulminate of mercury is difficult to obtain, and it is very dangerous in the hands of those who are not accustomed to handle chemical preparations. For explosive letters, however, it has special advantages.

Fulminate of mercury already has a record in criminal annals, having been employed for some of the most famous deeds—for instance, for the bomb which was intended to murder Napoleon III, and quite recently in Paris in the attempt made upon the life of the King of Spain. It is a salt which has been known for the last century, and it is considered the most powerful of all explosives on the market, developing an enormous force. It is sensitive to heat, to even a slight shock, and to the action of concentrated sulphuric acid.

One of the most interesting instances of the use of this explosive was in 1894, when explosive books were sent to government ministers in France. In this case the middle part of the book was hollowed out to receive a box containing fulminate of mercury and nails and other projectiles. The pages were gummed together, and the book could be opened on one side only. A kind of firecracker which contains a vestige of fulminate of mercury, designed to explode by friction, was fixed in the bottom of the box, so as to explode the charge when an attempt should be made to open

the book. The nature of these dangerous volumes was discovered before they reached the ministers, and the latter were saved from frightful injuries or death.

It would seem at first thought to be rather difficult to make an explosive letter which should be capable of producing such serious effects, as there is so little room in such a missive for a sufficient quantity of the explosive. On the other hand, very small quantities—a few grains only—of fulminate are enough to cause terrible results. The letters are usually made as follows: A piece of corrugated packing paper is prepared, four square holes being cut in the smooth surface, and the corrugations filled with fulminate of mercury, over which thin paper is fastened by gumming around the edges. Then detonators from bon-bon crackers are gummed to the little infernal machine and also to the flap of the envelope in which it is placed, so that if the envelope is opened with a paper knife or torn open in the usual way, the charge at once explodes.

Although, as has been said, it is difficult to purchase fulminate of mercury, it can be manufactured by any one possessing even a slight knowledge of chemistry. Only a few materials and reagents are necessary in order to produce the salt, and it is essential merely to take precautions while it is being dried. When only a few grains are required, a little of the mercury of nitric acid and alcohol, easily obtainable, suffice. The manner of its manufacture is no secret, and indeed, is described in treatises on chemistry.

Lighting Streets by Clockwork.

An automatic gas controller has been patented which may materially lessen the cost of public lighting in cities, if it works as the owners claim. The controller is said to be adaptable to any kind of incandescent burner, to fit any lamp, and to be instantaneous in its lighting and extinguishing. The mechanism consists of a clock which can be so set as to light the gas each night, and extinguish it each morning so as to make an automatic variation of the time of lighting and extinguishing according to the calendar. In short, by means of a chart, the street lights are turned on and off, lighted and extinguished, at a different moment each day throughout the year, according to the season.

It is claimed that the controller requires no attention except winding once a week or fortnight, and that once set it would have to be adjusted again only at the end of a year. The gas can be turned on and off in the ordinary way, quite independently of the gas controller.

Oldest Tree in the World.

What is thought to be not only the oldest tree in existence, but the oldest vegetable inhabitant of our world, is the dragon tree of the Canary Islands. The age of one of these products is estimated at from four to six thousand years, having thus an antiquity comparable with that of the Pyramids. It must not be forgotten, however, that the "big trees" of California claim an antiquity equal to this.

New Devices for Automobiles.

The automobile is being steadily improved as its use is widening. The latest is a detachable rim for wheels, which will appeal to all chauffeurs through its labor-saving quality. It has always been a hard task to replace a tire, by the old method, and the new device makes it much easier. The detachable rim is flanged in the ordinary way. Near the outer edge of the rim six projecting ears are riveted, and on the wheel itself are six bolts, designed to interlock with the ears. To inflate the tire it must first be dismounted, but the convenience of the new rim will be appreciated by all autoists.

The pneumatic tire is also receiving attention, and a French writer is urging the use of something besides air to inflate it. In spite of good rubber and the absence of punctures, he says the air gradually forces its way through the tire, and there are two chemical reactions constantly going on, caused by the oxygen in the air. The rubber is modified to some extent by the oxidation that takes place, and the sulphur used in manufacturing the rubber undergoes a complex oxidation. Thus the rubber tire gradually loses its flexibility, gets hard, and cracks. Microscopic holes are thus formed, and the tire easily loses the air pumped into it.

To avoid this the writer suggests the use of nitrogen to inflate the tires, as it has very little chemical effect on rubber or sulphur. He claims that recent tests where nitrogen was used have proved very successful. It is true that nitrogen is not as cheap or as generally available as air, but it may be that in the long run its use would be found more economical.

Wolfram Electric Light.

The carbon filament for glow lamps has been replaced, in an invention now undergoing the test of practical operation, by fine wire of wolfram, which is said to employ only one-third of the energy heretofore required. An experiment showed that after use of one thousand hours, there was an average loss of brilliancy of 6.3 per cent in the case of 25-candle-power lamps, and 3.6 per cent in the 32-candle-power lamps, which compares favorably with the results from the use of carbon.

Wireless Airship.

Professor Bell, the inventor of the telephone and other scientific apparatus, has been experimenting with airships, and recently made a test of a wireless aeroplane. The ship was steered by a Chicago aeronaut, and rose 200 feet, turned a complete circle, and came back to its starting point without accident. Dynamos on the ground supplied the electrical energy to the aeroplane's propellers by wireless contrivances.

Postage Stamp Machine.

An automatic postage-stamp selling machine has been devised which not only sells the stamps but sticks them on the letter. The machine possesses the additional advantage of being impossible to rob. You press the button and the machine does the rest.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,

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Plow..... H. A. Beham
Plow..... R. M. Warren
Plow..... S. H. Tucker
Plow sulky attachment..... J. W. Turner
Pneumatic control system..... E. J. Brink
Pneumatic despatch apparatus..... C. F. Stoddard
Pneumatic despatch apparatus carrier..... C. F. Stoddard
Pneumatic despatch tube apparatus carrier..... 2 pats..... C. F. Stoddard
Pneumatic despatch tube apparatus carrier..... J. S. Palmer
Pneumatic despatch tube system..... J. S. Jacques
Pneumatic motor..... T. Turner
Poisons. Obtaining solutions of bacterial..... B. Bergell et al
Pool table pocket..... W. H. Houts
Portable elevator and corn husking mechanism. Combined..... O. S. Ellithorp
Power generator. Electromagnetic..... R. A. Miller
Power plant..... F. Yeoman
Preserve box opening device..... S. Opal et al
Preserved food tin..... J. Amtmann
Printers' leads. Machine for finishing..... C. C. Webster
Printing attachment for paper roll holders and cutters..... M. McMahon
Printing machine. Platen..... F. Waite
Printing mechanism..... G. W. Swift, Jr
Printing plate. Producing a combined line and half tone..... C. A. Bonfils et al
Printing plates. Mounting block for..... A. W. Harrison
Printing press, gripper creaser..... J. R. Morrison
Printing press ink fountain..... J. W. Kohl
Printing type..... E. B. Oswalt
Propeller. Oscillating blade or fish tail..... G. E. Wade
Protractor. Bevel..... P. Kelly
Pulverizer..... P. L. Simpson
Punching machine..... A. Vernet
Pyrometer..... G. Heeley et al
Rail anchor..... F. A. Poor
Rail fastening apparatus..... L. G. Hoon
Rail joint..... B. Wolhanpter
Rail joint..... E. H. Schwartz
Railtie..... L. Mitchell et al
Railtie and fastening reissue..... J. G. Snyder
Railway block signaling system..... A. J. Wilson
Railway bumper..... J. M. Scott
Railway gate..... W. H. Myers
Railway rails. Electrical connection for..... E. Hayward
Railway signal..... C. J. Coleman
Railway signal..... C. W. Coleman
Railway signal apparatus..... J. W. Latta
Railway signal. Electric..... H. Smelser
Railway switch..... P. D. Hibner
Railway tie..... F. V. Bicking
Railway tie and fastening. Metallic..... A. Morrison
Railway tie. Metallic..... J. J. Moore
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Railway track construction..... S. G. Howe
Railway track drill..... A. H. Handlan, Jr
Railways. Electrical apparatus for setting the points and signals on..... L. Kottmair et al
Razor blade cleaner..... A. F. Smith
Razor. Safety..... F. H. Arnold
Reamer..... C. E. Martin
Receptacles and the like. Means for supporting..... G. A. Lutz et al
Receptacles with capsule and wire. Closing device for..... B. P. De Medici
Resawing machine..... A. Meeen
Roadway and constructing the same Composite..... S. G. Howe
Rock drill. Hydrocarbon..... J. V. Rice, Jr
Rock drill mounting..... M. Hardsocg
Rock drilling machines. Device for use with..... E. M. Westos
Roof for mausoleums, tombs, vaults, &c..... C. E. Tayntor
Roof structure..... C. W. A. Koelkebeck
Rope fastener..... J. Brown
Roving and spinning frame..... W. Batton
Safety device or pin..... H. M. Willis
Sail hank..... M. Mansson
Sand mold flask..... J. Macphail
Sandpaper holder..... F. J. Peters
Sash balance..... J. N. Reiland
Sash fastener..... H. Salisbury
Saw filing machine..... C. J. Tatum
Saw guide..... E. H. Overholt
Scaffold..... J. V. Palmer
Scale. Automatic weighing..... 2 pats..... N. Nilson
Scale. Pitless weighing..... D. M. Orcutt
Scraper..... J. A. Traut
Scraper and regulator..... J. H. & G. B. Young
Screw..... T. E. R. Phillips
Screw machine..... G. T. Warwick
Sealing apparatus. Vacuum..... J. A. Landsberger et al
Sealing machine. Envelop..... W. B. Spencer
Seam for sewed articles..... J. T. Dowdall
Seeder..... R. H. Mouser, Jr
Seeding machine..... C. P. Sester
Selling device. Goods..... H. H. Bilsh et al
Separating materials. Apparatus for..... T. Blass
Sewage elevating and discharging apparatus..... E. A. Wilson et al

Sewing machine motor..... R. E. Grant
Sewing machine stop motion device..... E. B. Allen
Sewing machine take up..... W. M. Ammerman
Snade bracket..... P. F. Wagner
Shaft. Knockdown vehicle..... F. C. Ferris et al
Shafts. Stuffing joint for rotary..... P. Emden
Shaving mug and brush. Combined..... G. A. Roney
Shears..... J. E. Allen
Snears..... J. C. Greenfield
Sheet folding machines. Perforating and registering mechanism for..... A. Sturtevant
Shirt sleeve..... G. M. Edgerton
Shock loader..... O. E. Nelson
Sign. Advertising..... J. J. Patterson
Sign. Moving display..... T. B. Powers
Signals. Apparatus for producing submarine sound..... A. J. Mundy et al
Signaling apparatus..... G. F. Atwood
Signaling system. Electric block..... A. J. Wilson
Signaling system. Electric block and block section..... A. J. Wilson
Signaling system. Single track..... R. J. Hewett
Skirt hanger..... M. Beitman
Skirt marker..... F. H. Schofield et al
Skirt supporter..... B. F. Johnson
Smoke consuming furnace..... W. B. Estes
Snow plow. Railway..... N. Hill
Snow scraper..... O. W. Robins
Sodium perborate. Manufacturing..... O. Liebknecht
Solar heater..... C. L. Haskell
Solar heater..... F. M. Huntoon
Solder to can tops. Machine for applying..... H. Eachus
Sound reproducing instruments. Attachment to horns for..... O. G. Rose
Spike puller..... A. Dudy, Sr
Spinning frame top roll clearer..... J. T. Meats
Spool gluing and assembling machine..... I. A. Blood
Sprayer and fire extinguisher. Water..... J. R. Norman
Springs. Device for retarding the rebounding action of..... A. C. Walling
Square Folding..... J. Smith
Stacker. Hay..... J. H. Neeb
Stamping press..... A. Zidovec
Standard. Adjustable..... J. A. McCormick
Stay strip..... H. B. White
Steam engine..... G. W. King et al
Steam engine. Compound..... H. Anderson
Steam generator..... W. R. Willis
Steam trap..... H. Sandvoss
Steel. Manufacture of..... J. de Moya
Still. Water..... O. A. Nenninger
Stirrup. Safety..... K. Reim
Stock. Brick holder for use in the case of live..... C. L. Hutcheson
Storehouse for grain and other material..... J. H. Elward
Stove..... C. L. Gohmann
Stove..... W. J. Keep et al
Stovepipe..... H. D. & F. L. Hart
Straight edge..... O. Messinger
Strainer. Automatic liquid..... H. Wurdack
Substation protector..... F. B. Cook
Suit case..... J. A. H. Villmow
Supporting surfaces. Means for securing fixtures to..... J. H. Danver
Suspenders..... C. Ludolph
Switch operating mechanism. Self locking..... R. F. Gaunt
Table..... A. P. Switzer
Tailings trimmer..... H. J. Clark
Tank heater..... C. W. Blake
Teeth. Filling..... H. F. Strong
Telephone exchange system..... B. O. Fox
Telephone switchboard..... M. V. Mehren
Telephone system..... F. W. Dunbar
Telephone system..... H. R. Turner
Telephone system. Partyline..... W. W. Dean
Telephone trunking system..... W. W. Dean
Tent..... G. M. Kirby
Tent. Portable sick room..... J. C. & A. E. Moore
Theater chair. Disappearing..... F. Harvey
Thermopile..... H. Diecks
Thill support..... A. Dudley, Sr
Thresher and cleaner..... G. W. Tice
Timepiece regulator..... S. Sloan
Tinning. Material for protecting sheets, &c. in..... J. A. Kyle
Tire..... H. J. Mondor
Tire. Pneumatic..... V. H. McDowell
Tire tightener..... E. E. Graves
Tires. Forming inner tubes for..... A. H. Marks
Tobacco curing apparatus..... J. L. Bullock
Toilet companion..... S. J. Brown
Tool. Combination..... W. McCausland
Tool holder..... W. W. Carman
Tool support. Pneumatic..... M. Hardsocg
Torch. Marine..... P. Fuchs
Toy..... W. Haverman
Toy..... W. B. Hill
Toy structure. Knockdown..... L. Schoenbut
Track gage and level..... A. Barclonux
Traction engine..... W. N. Springer
Traction engine..... M. J. Hogan
Traction engine..... W. N. Springer
Tree-felling machine..... J. O. Rollins
Trolley..... P. J. Wires
Trolley wires. Catenary suspension for..... G. A. Mead
Trolley wires. Mechanical ear for..... T. E. R. Phillips
Trousers-creaser..... L. W. Young
Trowel. Adjustable..... P. F. Connelly
Truck. Merchandise conveying..... F. A. Blerie
Truss..... I. Sault
Tube expander..... W. H. Mathers
Tug loop..... R. P. Krork
Tuning hammer..... W. B. Ellsworth
Turbine..... G. Rischmuller
Turbine. Elastic fluid..... O. Kolb
Typewriter ribbon vibrating movement..... G. Scherer et al
Typewriter spacing mechanism..... C. J. Mohs
Typewriters. Paper-feeding mechanism for..... J. Maynard
Typewriting and other key-operated machines. Key action for..... J. T. Schaaff

Typewriting machine..... W. Fraser
Typewriting machine..... B. C. Stickney
Typewriting machine..... J. Felbel
Typewriting machine tabulating device..... C. J. Mohs
Typewriting machines. Device for locking the key levers in..... C. J. Mohs
Undershirt..... W. S. Milla
Vaccine matter. Apparatus for injecting solid..... H. Deperdussin
Valve. Air vent..... E. P. Allen
Valve. Automatic..... C. A. Dunham
Valve. Automatically closing..... T. H. Walker
Valve control and reverse mechanism..... J. W. Slater
Valve. Cut off..... I. P. Doolittle
Valve. Drain..... L. J. Ashworth
Valve. Float..... F. W. Axtell
Valve mechanism. Pneumatic..... B. Aikman
Valve. Throttle..... M. F. Cox
Vegetable cutter..... J. Neunkirchen
Vehicle..... G. E. Murrell
Vehicle body..... J. D. Artz
Vehicle brake..... J. B. Howerton
Vehicle brake..... G. S. Tebbetta
Vehicle brake..... W. K. Ashlinhurst
Vehicle. Motor..... E. H. Sheer
Vehicle top support..... H. Carrow
Vehicle wheel..... J. H. O'Daniel
Vehicle wheel..... J. C. Rutherford
Vehicles. Means for operating motor..... C. J. Coleman
Vending apparatus..... A. E. Harrison
Vending machine. Fluid..... J. A. Keyea
Ventilator..... C. E. Erby
Vessel unloading apparatus. Marine..... C. D. Ross
Vitroous article and treating same..... C. F. Marsh
Wagon body attachment..... O. Mark
Wagon box extension and end gate..... A. Pool
Wagon brake..... E. Smith
Wagon. Dump..... R. H. MacClerman
Wagon jack for portable grain dumps and elevators..... E. H. & H. V. Schroeder
Wagon. Sanitary dump..... F. G. Wiseloge
Wagon. Sprinkling..... C. M. Haeske
Waist holder and skirt supporter..... B. A. Sebring et al
Walls. Constructing retaining..... G. W. Jackson
Washboard..... J. T. Sargent
Washing machine..... W. M. Dight
Watchcase center..... A. Bavier
Water alarm. Electric..... A. Johnson
Water closet floor connection..... E. G. Watrona
Water cooler..... J. Greyer
Water motor..... L. C. Lewis
Water purifiers. Chemical solution elevator for use in..... J. Bowey, Jr
Water supply and purification system..... G. Pfeiffer, Jr
Water tube boiler..... H. Del Mar
Weather strip..... W. U. G. Shaw
Weaving machine..... S. Toyoda
Weed cutter..... O. O. Petty
Weighing machine..... G. Hoepner
Weighing machine. Power driven..... G. Hoepner
Weight. Apparatus for electrically indicating..... C. Russo
Wheel..... J. S. Miller
Window. Automatically closing..... H. F. Zahner
Window operating mechanism. Multiple..... A. G. Plitz
Window screen. Adjustable..... W. B. Phillips
Wire cloth fabric..... M. W. Floto
Wire connecting device..... L. Morgan
Wire grip..... H. T. McClean
Wire incker..... L. Morgan
Wood filling composition..... J. R. Fitzgerald
Yoke attachment. Neck..... D. N. Luse
Yoke attachment. Neck..... D. D. Nelson

DESIGNS.

Badge..... F. Eberle
Bottle..... W. C. Pressing
Cabinet. Bedroom..... J. C. Flynn
Fabric. Cloth..... O. C. Grinnell, Jr
Lamp. Gas..... R. W. Zierlein
Lamp. Incandescent..... 2 pats..... O. Helfft
Shoe scraper and cleaner..... A. M. & S. B. Stiles
Watch fob..... W. C. Norris

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Abrading surface to metal. Attaching an..... S. B. Archer
Acid derivative. Acetylene carbonic..... 2 pats..... C. Moureu
Advertising card..... J. B. Carroll
Air brake. Combined automatic and straight..... W. V. Turner et al
Air brake mechanism. Automatic..... W. McCook
Air moistener or evaporator..... J. W. Johnson
Air washer..... C. W. Rogers
Alternator. Inductor magneto..... L. J. Le Pontois
Anchor for ferry boats..... M. M. Hoos
Animal mouth opener..... A. Seabrant
Artist's plzque..... G. Brown
Automatic brake..... C. G. Cossairt
Automatic brake..... J. P. Blakeman
Automatic sprinkler..... C. E. Buell
Automobile cooling systems. Fan for..... A. Winton et al
Automobile dust guard..... D. C. Collier
Back rest. Adjustable stool..... L. M. Rich
Bag hanger..... H. & E. Sanborn
Baker's peel..... W. Fickett
Balls. Manufacture of golf..... A. B. & J. Macneil
Band cutter and feeder..... W. T. Madill
Bathing apparatus..... W. H. Cloud

Bath apparatus. Valve operating mechanism for shower..... T. F. Kewley
 Battery..... F. A. Decker
 Battery cell..... H. Gernsback
 Battery element..... F. A. Decker
 Beater..... J. Husser
 Bed brace..... W. W. Lockett
 Bed spring and mattress. Invalid..... E. B. Preston
 Bedstead..... F. G. Gale
 Bedstead guard rail..... C. E. Uhde
 Bedstead joint..... C. W. Higbee et al
 Beef shaving or slicing apparatus. Electro-mechanical..... F. H. Wurzbacher
 Bell. Electric..... H. E. Reeve
 Belt..... A. Reznicek
 Belt splicing implement..... F. M. Linderman
 Belt support..... A. M. Harris
 Bevel. Rafter and polygon..... A. O. Cannon
 Bicycle seat and luggage carrier. Combined..... J. Paterson et al
 Bin..... M. W. Coolbaugh
 Blinder..... C. G. Boden
 Blowpipe and soldering attachment. Combined..... P. P. Nungesser
 Boat. Foldable or collapsible..... I. O. Perring
 Boiler construction..... C. Kroeschell
 Boiler fine cleaner..... S. McAdoo
 Boiler gage. Automatic..... D. G. Cameron
 Bolting machine driving mechanism..... H. O. Bowsman
 Book. file, temporary binder, &c. Loose leaf..... A. & L. Myers et al
 Bottle. Non-refillable..... P. J. Leonard
 Bottle washing machine..... F. N. Young
 Bottles and similar articles. Apparatus for cleaning..... E. Weymar
 Bottles and the like. Cleaning..... E. Weymar
 Bracelet..... J. Bulova
 Bracelet..... E. F. Wilde
 Bracelet..... F. E. Crain
 Bracelet..... W. Wallentin
 Brake shoe..... E. Deitebach
 Breech loading mechanism..... H. T. J. Thronsen
 Brick kiln..... D. P. Guise
 Brick making device. Ornamental..... M. N. Grant
 Brick molding machine..... T. G. Jensen
 Bridge structure..... J. P. Nickonow
 Briquet making machine..... E. D. Misner
 Broom..... N. Villalaz
 Brush or mop holder..... E. E. Masters
 Brush. Rotary..... D. F. Broderick
 Brushes. Making..... J. Morrison
 Buckle..... I. Blum
 Building block molding machine..... S. H. Rickard
 Building blocks..... P. Olson
 Burial casket. Drop front..... W. H. Lawson
 Button. Detachable..... Z. M. Leger
 Cable Aerial..... G. Strambini
 Cable cutting device..... C. Petrie
 Calculating machines. Adjusting ever arrangement for..... F. Trinks
 Calendar rollers for producing embossed or raised patterns..... J. Kleinewefers
 Camera..... W. F. Folmer
 Camera shading hood..... J. D. Garfield
 Can closure..... A. L. Caprini
 Candy working machine..... F. H. Richards
 Cane straw cutting machine. Sugar..... J. MacCallejas y Becerra
 Car and locomotive. Electric..... C. de Kando
 Car brake mechanism. Tram..... G. J. Conaty
 Car construction..... E. I. Dodds
 Car coupling. Automatic..... O. F. Richter
 Car door safety device. Hopper..... A. Christianson
 Car dumping apparatus screen..... C. A. Fry
 Car. Electric tram..... G. J. Conaty
 Car frame. Railway..... W. F. Kiesel, Jr
 Car. Gondola..... E. I. Dodds
 Car grain door. Railway..... N. H. Conger
 Car loader..... G. A. Kenner et al
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 Car sill and bolster construction. Railway..... E. I. Dodds
 Car underframe. Metallic..... E. I. Dodds
 Cars. Bellows fold coupling for vestibule..... E. L. Perry, Sr & Jr
 Cars. Circuit closing mechanism for indicators on..... T. W. Small
 Cars. Steel side stake for..... E. I. Dodds
 Carbureter..... E. L. Mueller
 Carbureter..... V. C. Severance
 Carbureter..... J. R. Schrader
 Castings. Twin cupola process of making semisteel..... J. C. Davis
 Cement block. Reinforced..... E. J. Brooks
 Chair..... C. W. Hieber
 Cheese cutter..... L. Swank
 Chocolate coating machine..... H. C. Remmers
 Chuck..... J. Pearson
 Cigarette former..... R. Hoffmann
 Circuit catching device and electrical system for use in conjunction with the same..... A. H. Graves
 Circuit closer. Automatic..... L. Charbonneau
 Clasp..... W. H. Williamson
 Cleaning cylinder. Rotary..... W. M. Krickbaum
 Clock winding mechanism. Self-winding electric..... H. W. Porter
 Cloth pressing buck..... J. Ecker
 Cloth pressing machine buck..... J. Ecker
 Clothes line holder..... L. Willour
 Clutch. Friction..... A. Master
 Clutch operating mechanism..... J. S. Detrick
 Clutch operating mechanism..... C. W. Hamann
 Cock. Automatic steam and hot water safety..... J. A. Frey
 Cock for locomotives. Cylinder..... E. J. Ferris
 Coffee. Method of improving..... A. E. B. Gram
 Coin holding and delivering machine..... J. W. Meaker
 Coin holding and delivering machine..... J. W. Meaker
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 Coke discharging apparatus..... L. Albrecht
 Coke drawing machine..... M. F. Stinkard
 Collar. Horse..... W. B. Estes
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 Collar shaping machine..... C. W. Currier et al
 Coloring matter. Azo..... M. Kahn et al
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 Column support..... T. F. McCarthy
 Combination lock..... J. W. Raymond
 Compound engine..... W. A. Webster
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Concrete and like material. Reinforcing bar for..... S. B. Williamson
 Concrete mixer..... G. E. McArthur
 Concrete mixer..... E. E. Jackson
 Condiment holder. Compound..... L. B. Parker
 Conveyor..... W. H. Lorenus et al
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 Corner shield and caster. Combined..... A. J. H. Kuhsiek
 Cotton chopper..... H. R. Hurst
 Cotton chopper and cultivator. Combined..... N. K. Robertson et al
 Cotton chopping and scraping machine..... J. Nelson
 Cotton gathering apparatus..... J. F. O'Shaughnessy
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 Counterboring tool..... V. Bail
 Crane. Overhead traveling..... C. L. Taylor
 Crank joint. Double..... W. L. Morrow
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 Cultivator attachment..... H. O. Pope
 Cultivator. Tongueless..... C. E. Macbeth
 Curtain pole..... G. Gerhelser
 Cuspidor..... J. Knapp
 Cutter head..... E. S. Shimer
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 Cutting bit. Eccentric..... J. H. Tombragel et al
 Dam. Collapsible..... W. W. Jones
 Dam crest. Automatically movable..... W. R. Davis
 Dental bar and excavator..... W. Boman
 Derrailer..... S. W. Hayes
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 Derrick. Loading..... N. H. Nelson
 Dipper..... C. F. Smith
 Disinfectant for water closets..... W. H. Ermentrout
 Disintegrating amorphous bodies..... E. G. Asheson
 Display box..... C. C. Alen
 Display box..... C. C. Rahn
 Display package..... H. C. Schmitz
 Display rack..... E. B. Weston
 Display rack..... A. B. Losee
 Display rack. Extensible..... C. K. Hurd
 Distilling apparatus..... H. A. Abendroth
 Dock..... W. E. Everton
 Door for fire departments and openers therefor. Folding..... L. E. Hale et al
 Door lock..... W. W. Fessler
 Door. Rotating..... M. C. Gage
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 Doors. Windows and the like. Fastener for..... E. W. F. Sachse
 Draft equalizer..... H. C. Horn
 Drawer..... G. W. Address
 Drilling machine..... C. Ridderhof
 Dumping apparatus. Automatic..... R. Z. McCoy
 Dust pan. Folding..... J. A. Delaney et al
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 Dynamo machines. Parallel running of..... C. A. Parsons et al
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 Eggs, cream, vegetables, &c. Beater mixer and mixer and masher for..... W. Sturma
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 Electric motor..... A. M. McCoy
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 Electric motors. Ventilation of..... G. Gibbs
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 Electric switch. Automatic..... W. F. Irish
 Electric time switch. Automatic..... L. C. Dorland
 Electric tram system..... O. J. Davy
 Electrical contact apparatus..... J. C. Boyd
 Electrical synchronism..... E. F. Northrup
 Electrode for therapeutic use, &c..... E. T. Nealey
 Electroplating apparatus..... H. R. Boissler
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 Fabrics. Device for cutting float threads of..... J. Cunne
 Fan..... B. Guggenheim
 Fan motor..... S. C. Bancum
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 Feed bag..... W. H. Robinson
 Fence gate..... P. Mast
 Fence machines. Magazine for wire..... O. S. Sturtevant
 Fence post..... A. Bowers
 Fence post..... W. C. Wix
 Fencing tie. Wire..... E. E. Tobias
 Fertilizer distributor..... G. T. Vaughn
 Fertilizer distributor..... H. T. Young
 Fibrous stock feeder..... S. W. Woodbury
 Filter..... R. Koehler
 Filters. Distributing machine for closed..... H. W. Blaisdell
 Fire alarm..... G. A. Anderson et al
 Fire alarm box. Auxiliary..... F. W. Cole
 Fire resisting curtains. Hood for rolling..... E. H. McCloud
 Fire resisting shutter..... W. S. Hutchinson
 Firearm..... J. E. Mason
 Fish decoy or lure..... G. F. Bowersox
 Fish line reel..... E. Baumgartel
 Fish net stake..... E. J. Hopkins
 Flanges. Machine for attaching..... W. W. Doolittle
 Floor and laying same..... T. Cantwell
 Flue cutter..... F. E. Shimer
 Fluid pressure regulator..... W. J. Richards
 Flying machine..... W. Morgan
 Fork..... F. Lotter
 For n. Garment..... C. Frankel
 Form marker. Bust..... A. Waterman
 Fowls. Registering means for..... L. S. Linder
 Frequency meter..... W. H. Freedman
 Friction lock..... W. A. Barker
 Fruit. Skinning..... J. B. Thompson
 Furnace..... W. N. Best

Furnace door..... A. W. Drago
 Furniture Combination..... J. L. McKensy
 Furniture spring..... B. A. Chubbuck
 Fuse box..... C. A. Rolfe
 Game board..... L. B. Sanford
 Garment hanger..... F. Bement
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 Gas burner. Incandescent..... F. T. Williams
 Gas burner regulator..... W. C. Homan
 Gas. Enriching blast furnace..... C. Ellis
 Gas generator. Acetylene..... G. Laporte
 Gas generator. Acetylene..... T. Babin et al
 Gas light..... H. W. Manning
 Gas purifying materials. Revivifying..... H. L. Doherty
 Gasket..... W. B. Haynes
 Gate hanger..... C. A. Miller
 Gate or door hook..... O. G. Parsons
 Gearing..... W. J. Lloyd
 Glass fastener..... A. T. Moore
 Glass. Process and apparatus for fire polishing plate..... P. T. Sievert
 Goggles..... T. W. Black
 Grave record..... T. P. Pigg
 Groove cutting machine..... P. Bontenakels
 Gun sight..... H. Gunn
 Gun stock. Jointed..... H. W. Munson
 Guns. Automatic extractor for detonating cartridges in breech loading..... E. Olsson
 Guns that recoil on their carriages. Compressed air brake for..... J. A. Deport
 Hand shield..... L. B. Tebean
 Harpaction..... C. A. Lindeman
 Harrows. Adjusting lever and ratchet connection for..... G. E. Blaine
 Harvester. Beet..... W. H. McCall
 Harvester. Cotton..... D. Murphy
 Harvester grain lifting attachment..... A. H. McCutchan
 Hasp fastener..... C. S. Morse
 Hasp lock..... P. Grabler
 Hay and grain loader, unloader and stacker..... A. Lage
 Hay carrier..... J. R. Combs
 Hay rake. Horse..... A. F. Kearns
 Header..... W. Jacobs
 Heat regulating apparatus..... N. E. Nash
 Heater..... H. J. Lange
 Heating apparatus..... S. H. Garst
 Heating furnace..... E. E. Graham
 Hemmer..... A. L. Madison
 Hinge..... W. H. Fitzgerald
 Hinge pin and joint..... R. G. Schutz
 Hitching weight..... I. Matsumoto
 Hoe..... W. A. Sparks
 Hoister drum with hollow shafts..... A. Lambert
 Hoisting apparatus..... F. D. Millen
 Hoisting apparatus..... V. R. & E. H. Browning
 Hook..... W. O. Bement
 Horse. Adjustable folding..... T. V. Struble
 Hose supporter..... J. H. Stoltzfus
 Hot air furnace..... C. F. A. Roell
 Hot water circulating system..... C. C. Peck
 Hull cleaning and friction reducing apparatus..... W. A. Partee et al
 Hydraulic press..... B. Gerdau
 Impact and reaction motor..... C. Comstock
 Incubator..... W. F. Mikolasek
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 Indigo coloring matters. Reducing..... R. Wimmer
 Ink well..... J. Schlapp
 Innersole finishing apparatus..... G. E. Rollins
 Insulator. Electric..... 2 pats. H. O. Can Dee
 Insulator..... W. G. Clark
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 Cabinet. Delivery..... D. H. Wehagen
 Cableway. Suspension..... L. C. McCormick et al
 Calenating device..... B. M. Des Jardins
 Campaign device..... G. A. Beidler

Camping outfit. Combination..... C. Massey
 Cans and the like. Apparatus for treating tin..... M. Leitch
 Candy machine..... Z. S. Hoffman
 Cane knife. Foot power..... W. L. Spencer
 Car..... F. A. Boole et al
 Car. Auto snow..... J. Sherwood
 Car brake staff. Railway..... E. Posson
 Car coupling..... A. J. Brazeley
 Car guard. Street railway..... S. E. Pressler
 Car haul safety device..... W. W. McFarren
 Car magnet support..... W. M. Brown
 Car. Semiconvertible..... E. T. Robinson
 Car switching mechanism. Railway..... W. C. Sharp
 Car ventilator..... P. P. Carroll
 Car vestibule..... E. L. Forgren
 Cars. Car holder for railway..... E. Gurley
 Cars. Steam heating system for railway..... A. Hillisch
 Carbureter..... L. Renault
 Carbureter..... C. Smith
 Carbureter..... 2 pats..... M. D. Colbath
 Carbureter for explosive engines. Double. reissue..... T. L. & T. J. Sturtevant
 Card. Score..... P. H. Keele
 Cards. Feeder for intermediate..... O. G. Petterson et al
 Carrier holder. Filling..... G. Boissonneault et al
 Casting machine..... B. T. McGlone et al
 Catapult..... S. D. Dills
 Catheter user's mechanical assistant..... J. F. Spalding
 Cement and apparatus therefor. Process of burning..... C. Ellis
 Cement block machine..... J. H. Miller
 Cement building block making machine..... A. H. Coombs
 Cement. Manufacture of..... F. M. E. von Mollenbruck
 Cement roofing tiles. Machine for making..... J. Liening
 Cesspool..... E. Heber
 Chain. Drive..... G. G. Howe
 Chain. Solid link knife jointed..... H. A. House
 Chair..... J. Salomon
 Chair..... J. S. Lester
 Change making machine..... H. Binney
 Check. Sales..... G. Heinersdorf
 Chuck. Drill..... R. Temple
 Churn..... T. J. Cheney
 Churn and butter worker. Combined..... G. J. Kaplan
 Churn. Butter..... S. M. Pearson
 Cigar lighting apparatus. Electric..... S. M. Meyer
 Circuit breaker..... F. O. Hartman
 Circuit breaker for electrical conductors..... W. C. Shaw
 Closure. Valved..... G. Demackos
 Clothes drier. Folding..... D. Sherlock
 Clothes pin bag..... I. S. Vanderbilt, Jr
 Clutch..... J. A. Russell
 Clutch..... J. C. Dawson
 Clutch controlled elevator..... H. H. Cutler
 Clutching device..... D. E. Krause
 Coal drill..... J. Kautika
 Coal hod..... 2 pats..... G. F. Duffett
 Coat and hat rack. Combined..... F. Hallen
 Coffee making apparatus..... W. C. Richardson
 Coffee pot filter..... C. Monroe
 Coin controlled mechanism..... M. O. Anthony
 Colors. Yellow and orange pigment..... M. Becke
 Column..... 2 pats..... G. F. Thorn
 Comb..... J. J. Schultz
 Comb and hat fastener. Combination..... P. Edwards
 Compasses and similar instrument..... C. M. Bernegau
 Compensating mechanism..... L. M. Osborn et al
 Compound engine..... M. A. Neeland
 Concrete and metal construction..... A. L. Johnson
 Condensation preventer..... E. O. Capen
 Condenser..... N. H. Miller
 Condnits. Pulling box for..... A. Hawkinson
 Confection forming machine..... W. W. Lysinger
 Control system..... H. E. White et al
 Controller..... H. E. White
 Controller. Three wire reversible drum..... T. E. Barnum
 Controlling and positioning device..... B. O. Hale
 Cord and rope machine appliance..... P. M. Stegmaier
 Cord or string cutter..... A. F. Hoffman
 Core..... F. W. Young
 Corner bead for the protection of plastered corners. Metal..... G. S. Knapp
 Corner strip..... E. Nichols
 Cot back. Adjustable..... B. C. Leavitt
 Cotton gin..... D. David
 Cotton picker..... O. H. P. Cornell
 Cracker box..... J. B. Arthur
 Crane. Kettle..... L. H. Reibold
 Crane. Overhead traveling..... C. L. Taylor
 Crane. Tunnel..... E. L. Smith
 Crate..... R. Morgan
 Crate. Knockdown..... W. B. Barnes
 Creosote trap..... E. C. Cole
 Cross tie. Metallic..... M. F. Bonzano
 Cuff holder..... G. I. Scheffer
 Cultivator and fertilizer distributor..... G. D. Bennett
 Cup and cup handle..... G. F. Walker
 Currents. Increasing the efficiency of alternating..... I. Kitsee
 Currents. Means to increase the efficiency of alternating..... I. Kitsee
 Curtain bracket. Window..... L. E. Gillmore
 Curtain pole..... J. E. Willson
 Cutting board..... W. A. Harman
 Cutting implement..... H. Harden
 Dam and apparatus for and method of constructing the same..... H. L. Cooper
 Dental gold pellet holder..... H. P. Davis
 Derrick..... W. L. Allan et al
 Designs to surfaces. Applying D. B. Marwick
 Die and pattern making machine..... F. P. Pfeighar
 Display cabinet. Lace curtain..... C. B. Westbrook
 Display fixture..... H. Frankel
 Display stand..... G. H. Richardson
 Display stand..... G. P. Sardou et al
 Door hanger..... 2 pats..... T. C. Prouty
 Door lock. Corridor..... H. G. Voight
 Door operating device..... C. W. & H. C. Butler

Doors. Roller support for..... L. Remond
 Draft mechanism for wagons..... N. Halvorsen
 Draft rigging and body bolster. Separable..... W. H. Scott
 Drawer pull..... D. K. Snyder
 Dredge pin and joint..... G. B. Shipley
 Dredge pin and joint..... E. L. Voy
 Dredge pin and joint..... L. P. Martin
 Drying frame..... J. W. Miller et al
 Dust removing device. Sanitary..... E. I. Nichols
 Dye and making same. Monoazo..... T. Kroeber
 Dye and making the same. Blue quinolin..... B. Homolka
 Dye. Making an anthracene..... R. Bohn
 Dyestuffs from waste dye liquids and washing liquids. Apparatus for recovering sulfur..... J. Schmitt
 Dynamo. Portable..... G. A. Allen
 Egg tester..... H. H. Brown
 Electric circuit metering and controlling system..... J. J. Wood
 Electric conductors. Safety device for overhead..... E. Giraud
 Electric controller..... E. Marshall
 Electric heater..... E. R. Waterman
 Electric light switch..... J. McGavock
 Electric motor..... 2 pats..... C. R. Meston et al
 Electric motor..... J. B. Wantz
 Electric motor controller..... H. U. Hart
 Electric motor controllers. Alternating current retaining device for..... T. E. Barnum
 Electric motor drum controller..... T. E. Barnum
 Electric motor self starter..... H. H. Cutler
 Electric motor speed controller..... R. Temple
 Electric switch..... C. E. Eveleth
 Electric switch controlling system..... E. M. Hewlett et al
 Electric time switch..... M. I. Flowers
 Electric trimming apparatus..... F. J. Rush
 Electrical protective apparatus..... C. A. Rolfe
 Electrolytes. Apparatus for regenerating..... L. H. Baekeland
 Elevating graders. Belt tightening appliance for..... T. R. McKnight
 Elevator safety device..... W. Lowry
 Enamel ware, china, porcelain, majolica, glass, &c. Decorating..... R. Gottlieb
 Engine cooler. Explosive..... E. A. Johnston
 Engine coupling. Traction..... R. Johnson, Sr
 Engine frame. Locomotive..... C. T. Westlake et al
 Engine regulating device. Gas..... H. S. Molony
 Enginespark plug. Explosive..... A. R. Bullock
 Engine speed regulator..... C. A. Suckney
 Engine speed regulator. Gss..... T. Holmager
 Envelop opener..... C. G. Bauer
 Evaporator..... A. A. Dunham
 Excavator..... L. V. Springer
 Excavator..... M. D. Kuchford
 Extension table..... G. W. Peck
 Eye protector..... E. Mirovitch
 Eyeglass or spectacle mounting..... E. Clarke
 Eyeglass spring..... M. Gold
 Eyeglasses..... P. Peek
 Eyeglasses..... A. C. Kintner
 Fabric opening and stretching apparatus..... W. Birch
 Fare register actuating mechanism..... A. O. Schmolinski
 Farm gate..... H. E. Williams
 Feed water regulator..... T. Keenan
 Feeding, cleaning and elevating apparatus. Combined..... E. B. Anderson
 Fence post setting tool..... W. Hunter
 Fencing tie. Wire..... C. T. Collier
 Fender support..... D. McCausland
 Fertilizer spreader..... J. O. Linden
 File clip..... W. M. Ellett et al
 Filter..... A. J. Sheridan
 Filtering apparatus..... G. L. Bayley
 Fireproof construction for buildings..... J. Jacobs
 Fireproof stair structure..... E. E. Schachner
 Fishing net..... E. H. Haskell
 Fishing seine..... N. H. Elenters
 Fleece dividing apparatus..... A. Lejeune
 Floor, grits, and the like. Apparatus for aerating and cleaning..... C. Trettan
 Flue cleaner..... G. C. French
 Fluid pressure engine..... J. H. Allen et al
 Fluid regulator..... T. Lowe
 Fluid shut off. Automatic..... E. L. Cridge
 Folding chair..... W. Gymer
 Folding machine sheet registering device..... H. K. King
 Food products. Apparatus for treating..... D. Genese
 Formaldehyde generator..... R. W. Dodge
 Fruit picker..... P. Koerper
 Furnaces. Apparatus for regulating combustion in..... H. L. Doherty
 Fuse and switch. Combined..... H. Geisenhoner
 Game apparatus..... T. J. Falvey
 Game apparatus..... E. A. Larsen
 Garment clasp..... J. D. Karle
 Garment Combination..... L. S. Foerster
 Garment fastener..... J. E. Waterman
 Garment fastener..... E. E. Willey
 Garment hanger..... E. L. Henderson
 Garment hook..... A. Wagner
 Gas controlling means..... F. H. Oehlke
 Gas. Drying..... G. G. Smith
 Gas generator. Acetylene pats..... S. M. Meyer
 Gas lighting. Producing mantles for incandescent..... J. A. E. B. Boullier
 Gas washer..... 2 pats..... F. E. Bachman
 Gate..... J. C. & J. A. Fischer
 Gate..... J. F. S. Goble
 Gate..... C. J. Singer
 Gear cutter. Turret..... E. R. Fellows
 Gear cutting machine..... W. A. Jordan
 Gear mechanism. Change..... W. L. Schellenbach
 Gearing..... F. B. Tyson
 Gearing for drilling machines, &c..... A. E. Newton
 Gearing. Transmission..... R. Symmonds
 Glass amalgamating and annealing oven. Wire..... J. I. Arbogast
 Glass articles. Apparatus for fire polishing..... S. O. Richardson, Jr
 Glass. Manufacture of wire..... 2 pats..... F. L. O. Wadsworth
 Glass. Method of and machine for making wire..... N. Franzen
 Glass plate holding clamp..... L. Gallot
 Glass press..... H. B. Koehler
 Glass. Producing wire..... J. I. Arbogast
 Glass sheets. Making..... F. L. O. Wadsworth
 Glasses. Cover for..... R. L. Adams

Glassware making machine..... E. S. Hutton
 Gluing machine. Cardboard..... P. Lawrence
 Grain distributor..... H. B. Bezzard
 Grain improving apparatus..... C. Trettan
 Graphite and deflocculation thereof. Deflocculated..... E. G. Acheson
 Grate bar..... A. L. Howard
 Grave filling device..... C. E. Rice
 Grease pot..... T. Gill
 Grinding machine. Cutlery..... 2 pats..... C. L. Joy
 Grindstones. Water pan or hood for..... E. H. Cheesbro
 Hacksaw..... E. Wentworth
 Hair crimper..... J. F. Martin
 Harrow..... J. L. Ware
 Harvester..... T. M. E. Seierup
 Harvester. Cotton..... J. O. Dickinson
 Hay carrier..... H. L. Ferris
 Hay rake and cocker..... W. C. Trussell
 Hedge trimmer..... P. F. Seabloom
 Heel attaching machine..... E. Woodward
 Heel. Boot and shoe..... J. F. Lober
 Hinge..... J. W. Tatum
 Hitching device. Horse..... J. E. Hugus
 Hog carrier..... R. Henderson
 Hoist. Electrically controlled skip..... H. H. Cutler
 Hoisting apparatus..... P. W. Sienrin
 Horse detacher..... H. A. Smith
 Hose rack..... W. McClintock
 Hydraulic elevator..... W. L. Weber
 Hydrocarbon burner..... J. J. Richardson
 Incandescent mantle support..... M. Offenber
 Inhaler..... M. Green
 Ink well or stand..... W. E. Pitcock
 Insect trap..... G. Dittmann
 Insect trap..... N. W. Mills et al
 Insulating the interior sides of hollow bodies..... O. Koszovits
 Insulating wire holder..... A. Hatchett
 Internal combustion motor..... J. Treen
 Ironing table..... A. L. Miller
 Jaw crusher..... M. G. Bunnell
 Journal box..... S. Murphy
 Justifying apparatus..... E. Wentscher
 Key changing device for keyed instruments..... J. Ramsperger
 Kneading and mixing machine..... E. F. Wieda
 Lacing hooks. Gage attachment for machines for setting..... W. Halkyard
 Ladder and bench. Combination..... A. G. Johnson
 Lamp..... L. W. Anderson
 Lamp. Acetylene..... S. M. Meyer
 Lamp. Arc..... J. H. Bennett et al
 Lamp chimney. Incubator..... W. A. Summer
 Lamp. Electric arc..... F. Janacek
 Lamp for automobiles and other vehicles..... S. M. Meyer
 Lamp lock. Incandescent..... J. F. Boyer
 Lamp self lighting attachment..... S. M. Meyer
 Lamp socket. Incandescent..... J. G. Peterson
 Lamps and oil stoves. Electric lighting device for..... S. L. Meyer
 Lamps. Electric lighting apparatus for incandescent and other gas..... S. M. Meyer
 Lamps. Luminant in electric incandescent..... F. M. F. Cazin
 Land roller..... J. Weber
 Lantern holder..... W. T. Gover
 Last. Hinged..... G. G. & J. C. Schelter
 Last. Shoe..... J. C. Schelter
 Latch for doors, &c. Sure catch..... J. B. Aikin
 Lathe. Screw cutting..... J. C. Smith
 Lathe tool holder..... G. T. Reiss et al
 Leach clearing apparatus. Portable..... O. Seidel, Jr
 Life preserver..... M. Cline
 Lifting jack..... L. J. Dunn
 Lineman's chair..... G. P. Yeake et al
 Linotype machine attachment..... W. N. Bowman
 Liquid cooling apparatus..... H. L. Doherty
 Liquids. Thief for testing..... T. R. Weymouth
 Liver cutting board..... J. Meyers
 Loading apparatus. Trimming device for..... S. J. Blake
 Lock and latch..... H. G. Voight
 Locks. Keyhole shutter for..... H. G. Voight
 Locomotive..... W. L. Austin
 Locomotive..... S. M. Vaucalin
 Loom pattern mechanism..... B. F. McGuinness
 Loom selvage motion..... C. F. Roper
 Loom stopping mechanism. Wire..... H. Lindsay
 Looms. Automatic tension device for..... E. Keuser
 Looms. Cloth finishing device for..... E. Bloom
 Lubricator..... J. Buckley et al
 Lubricators. Sight feed for..... J. Sherry
 Mail bag catcher and deliverer..... A. L. Logan et al
 Mail bag holder and deliverer..... H. G. Kimple et al
 Mail carrier..... T. W. Russell et al
 Mail carrying apparatus..... C. N. Libey
 Mangle..... A. Bess
 Mantle impregnating machine..... E. D. Anderson
 Manure fork or carrier..... L. Kniffen
 Marble. Integral or through coloration of..... E. L. Belloni
 Mattress frame..... F. G. Oale
 Measuring device. Rotary..... E. G. Kimmell
 Measuring machine. Cloth..... T. H. Nance
 Meat cutter..... S. D. Wheeler
 Mechanical movement..... T. C. Prouty
 Mechanical movement..... V. Smorowski
 Metal packs. Finishing..... C. W. Bray
 Metals from sulfids. Obtaining..... T. J. Heskett
 Metals from their ores. Separation of..... R. E. Saunders
 Metallic tie and rail fastener..... S. Sznitcko
 Mill roll controlling and positioning device..... B. O. Hale
 Molding apparatus..... F. McKee et al
 Molding machine..... H. W. N. Cole
 Motion and housing therefor. Means for converting..... C. J. Klein
 Motors as braking generators. Control system for connecting..... F. E. Case
 Motors. Oil retaining device for explosion..... J. L. Didier
 Mouthpiece guard. Sanitary..... R. R. Macgill
 Mower knife. Lawn..... L. E. Baker
 Mowers. Grass catcher for lawn..... J. A. Vye
 Mowers. Ratchet mechanism for lawn..... L. E. Baker
 Mowing machine finger bar..... H. Mehlhorn et al

Muffler J. E. Fairchild
 Multiplying and type writing machine W. W. Hopkins
 Musical instrument Mechanical P. Wuest Jr
 Musical instrument playing mechanism, Automatic P. Wuest, Jr
 Musical instruments. Valve for pneumatic E. de Kleist
 Musical sounds. Device for registering vibrations of L. R. Wheeler
 Nail feeding apparatus G. D. Parker
 Nautical apparatus F. Vanzini
 Neckwear. Article of W. H. Hart, Jr
 Needle threading device R. Summers
 Notch cutting machine L. W. Marshall
 Nut. Adjustable sleeved axle R. C. Williams
 Nut. Lock D. C. Mercer
 Nut Lock H. F. Rieschick
 Nut lock A. L. Strout
 Nut lock 2 pats. L. M. Gilchrist
 Nut lock E. W. Zollers
 Nut lock J. K. Gourdin
 Nut lock J. R. Thomas
 Nut lock J. H. Baldwin
 Oar W. Fentzwe
 Oil burner flame spreader J. H. Greenhagen
 Ores preparatory to smelting same. Treatment of F. Heberlein
 Organ pipe foot F. McCollough
 Packages of merchandise. Device for holding G. G. Rohrsen
 Packing. Piston rod H. W. Lee
 Padlock F. W. Schroeder
 Pail. Milk J. J. Nolty
 Pan and vessel lifter. Adjustable A. M. Mendelson
 Paper and paper board C. Esser
 Paper bag machine E. E. Claussen
 Paper making machine W. H. Hoffman
 Pen. Fountain 2 pats. J. S. Barnes
 Pen. Fountain H. W. Bahr
 Pen grinding machine G. Malpass
 Permutation lock L. B. Gaylor
 Phase splitter and clutch H. H. Cutler
 Phonograph horn A. Maurer
 Photograph holder E. H. Smith
 Photographic printing apparatus J. Kaut
 Piano pedal action G. Bjorklund
 Piano pedal attachment A. C. Bergman
 Piano playing mechanism. Automatic. P. Wuest, Jr
 Pinions and wheels. Machine for manufacturing and mounting A. H. Neureuther
 Pipe coupling. Automatic air and steam W. D. Thornton, Jr
 Pipe hanger W. F. Van Brunt
 Pipe wrench F. J. Dearborn et al
 Pit prop P. Mommertz
 Planter W. H. Holsclaw
 Planter, Corn H. W. Thomasson
 Plate lifter C. F. Smith
 Pneumatic cleaner P. Schaurer
 Pocket book. Imitation F. S. Egloff
 Pocket closer T. Slackowski
 Polisher and cleaner W. J. M. Hames
 Portable house A. H. Gill
 Potato digger J. L. Albin
 Powdered materials. Receptacle for W. West
 Power transmission device 2 pats. W. F. Sears
 Pressure mechanism. Automatic clamping J. M. J., A. J., & S. A. Gimson
 Printer's lead cutter E. I. Rice
 Printers' rollers. Machine for cleaning or treating 2 pats. G. Sague
 Printing plate. Half tone L. F. Smith
 Printing press feeding mechanism A. F. Harris
 Printing press ink fountain attachment R. J. Greenway, Jr
 Printing press. Rotary F. Newbold
 Projectiles. Manufacture of armor piercing R. A. Hadfield
 Pruning implement J. Bingham
 Pulley block A. Opsal
 Pulley rim E. W. Keller
 Pump R. Huff
 Pump. Non overflow B. G. Foster
 Pump. Vacuum J. J. Mullian
 Puzzle A. G. P. Ebert
 Rail chair and tie A. P. Seils
 Rail fastener E. Thornberg
 Rail fastener. Guard F. Cleary et al
 Rail joint E. M. Porter et al
 Rail joint. Step up G. L. Hall
 Railway gate J. M. Harrington
 Railway motor cable support F. W. Garrett
 Railway rail chair J. Crozier
 Railway rail tie plate C. E. Neubauer
 Railway sleeper and connection R. H. Ireland
 Railway tie and rail fastener J. Nichols
 Railway tie construction J. W. Webb
 Railway wheel A. S. Henry
 Ratchet J. Hegerhorst
 Ratchet. Automatic D. Kendall
 Receiver support J. Heisch, Jr
 Receptacle. Incased 2 pats. L. B. Schenck
 Recording device J. Dawson
 Rectal dilator C. R. Harris
 Rectangular can for dried beef and other articles E. W. Carnes
 Refrigerator L. Desforges, Jr
 Refrigerator door C. Stotz
 Registering lock E. F. Wells
 Releasable connection E. S. Clough
 Revolver J. L. Garner
 Ring bending tool L. M. Morden
 Rock drill H. Deitz
 Rock drill spray E. G. A. Rees-Gibbs
 Rolling mill S. V. Huber
 Rolling mill feeding device E. E. Slick
 Roofing. Sheet metal D. J. Winn
 Rotary engine J. C. Simmons
 Rotary engine J. B. Martin
 Rotary kiln W. C. Shiner
 Rubber tired wheel J. P. Johnston
 Rule and calipers. Extensible H. U. Prindle
 Saddle iron A. A. Warner
 Safes. Trap for preventing the burglarizing of iron S. M. Harden
 Sash cord clamp L. W. Strasbaugh
 Sash lock W. E. Duckenfield
 Saw dressing tool E. R. Cobb
 Saw handle J. Henry
 Saw table C. F. Haldeman
 Seam S. Borton
 Seat corner E. L. Forsgren
 Seat removing apparatus L. C. McAdams
 Seed dropper J. H. Grooters

Sediment catching pocket for receptacles W. M. Gilbert
 Seed hulls. Machine for treating cotton R. G. Laiting Jr
 Seeding machine 2 pats. L. E. Waterman
 Sewer trap for catch basins F. C. Few
 Sewing machine trimming attachment J. Zeldis et al
 Shade and curtain support. Window J. L. Smith
 Shearing machine R. Schofield
 Shears and tension screw W. A. Wilkins
 Sheet metal elbows. Machine for manufacturing A. G. Scherer et al
 Shingling gage P. L. Morris
 Shock loader A. Pfund
 Shoe tacking machine H. A. Ballard
 Shutt e H. Lindsay
 Shuttle release motion J. W. Kilpatrick
 Sign. Illuminated J. Hotchner
 Signal E. A. Wolf
 Signal flag. Folding metallic W. F. Walsh
 Signal flags, fuses and torpedoes. Receptacle for R. F. Stewart
 Skylight operator H. F. Russell
 Snap hook J. C. Welcome, Sr
 Soap dish J. P. Eustis
 Soldering iron W. F. Ryan
 Spade and analogous implement E. S. Williamson
 Spark coil J. F. Cavanagh
 Speed changing device I. Riddell
 Speed indicator J. T. F. Conti
 Speed mechanism. Variable R. K. Le Biond et al
 Speedometer G. Lombardi
 Spindles. Bobbin clatching means for rotatable G. W. Knight
 Spring pressing machine H. E. Spangler
 Spring recoil neutralizer A. Mans
 Square. Folding steel R. M. Smith
 Staircases. Construction of steps for E. Schachner
 Stake holder A. J. Bostwick
 Stamp. Double acting G. W. Beynon et al
 Staple fastener L. A. Platt et al
 Starch mod A. M. Baroddy
 Station Indicator C. J. Harter
 Stationery holder E. P. Lynch
 Stay bolt. Flexible B. E. D. Stafford
 Steam boiler. Water tube H. Del Mar
 Steam generator E. Solomiac
 Steam generator and radiator. Combined R. Watt
 Steam trap A. L. Riggs
 Steamboats and the like. Trimming weight for C. C. Rouillard
 Stem winding and stem setting mechanism L. C. Hanbroe
 Stocking protector B. Riely
 Storage and display receptacle J. D. Richardson
 Storage battery S. Lake
 Storage bin J. H. Tromanhauser
 Storm front or duster hood fastener W. E. Clark
 Stove furnace F. Eieberger
 Stovepipe collar L. Doerr
 Straw holder C. C. Mayes
 Stubble cutter 2 pats. W. A. McCollough
 Stuffing box F. Gielow, Sr
 Surgical appliance L. B. Hawley
 Switch throwing device W. H. Vaughn et al
 Syringe J. H. Dodson
 Syringe. Hypodermic G. R. Schimmel
 Tag wiring machine J. J. Englert
 Tags to clothing. Machine for attaching G. H. Wilkins
 Tap. Beer F. M. Pfuger
 Tap socket C. J. Heiser
 Tea kettle A. W. Cram
 Telephone attachment W. R. Whitehorne
 Telephone trunking system F. W. Dunbar
 Telephony I. Kitsee
 Tension device O. Pfander
 Tent. Hospital H. B. Thompson
 Threshing machine R. Sylvester
 Threshing machine sheaf carrier and elevator R. Sylvester
 Tile. Roofing E. E. Johnston
 Time computer and recorder G. B. uemel
 Tire. Solid rubber A. H. Marks
 Tires. Forming solid rubber A. H. Marks
 Tires or tire casings. Forming pneumatic A. H. Marks
 Tobacco curing apparatus B. L. Dixon
 Tool. Combination P. Novak
 Toy M. Borchardt
 Toy J. Griffin
 Toy animal C. Sackman
 Toy bank C. A. Bailey
 Toy ladder truck 3 pats. H. T. Kingsbury
 Toy rapid fire gun G. P. Campbell
 Track sanding apparatus F. L. Robinson et al
 Tracker bar. Pneumatic P. Wuest Jr
 Trolley wires. Mechanical ear for E. E. Gilmore
 Trousers press H. Dalitz
 Truck. Cement F. B. Burness
 Trunk C. H. Paxton
 Trunk flap locking means I. Mendel
 Tug fastener. Hame F. T. Lerch
 Turbine governing mechanism. Elastic fluid F. Samneilson
 Turpentine box A. C. McLeod
 Type justifier 5 pats. B. M. Des Jardins
 Type justifying machine 5 pats. B. M. Des Jardins
 Type justifying machine 5 pats. W. J. Ennisson
 Typewriter attachment E. W. Sweigard
 Type writing machine C. Gabrielson
 Type writing machine J. F. McElhinny
 Type writing machine P. T. Dodge
 Type writing machine A. Schneeloch
 Type writing or similar machines. Device for the justification of the lengths of lines of E. M. Marchthal
 Umbrella. Folding L. Z. Forgues
 Umbrella. Folding W. P. Hartnett
 Valve and air strainer for pneumatic drills. Throttle C. A. Carlson
 Valve attachment H. Bates
 Valve for controlling fluid pressure E. Hill
 Valve. Gas controlling H. W. Hill
 Valve gear J. Iversen
 Valve gear for explosive engines C. H. Morgan et al
 Valve. Tank J. H. Davis
 Vehicle O. J. Widmeier

Vehicle bow rest J. H. Sprague
 Vehicle. Dumping E. I. Nottingham
 Vehicle. Motor W. D. Lloyd
 Vehicle reach coupling J. A. Dann
 Vehicle running gear L. J. Simmers
 Vehicle spindle washer V. Scott et al
 Vehicle. Wheeled I. E. Palmer
 Vehicles. Gearing mechanism for motor L. B. Farmer
 Vehicles. Vapor burner for motor W. L. Garrels
 Vending machine C. T. Frantz
 Vending machine M. O. Anthony
 Vener cutting machine B. J. Sitten
 Ventilator L. A. McCalla
 Vessels. Protective device for frangible W. Constable
 Vises. Inset clamp for A. Kolb
 Wagon. Boy's A. M. Bollinger
 Wagon. Coal dumping D. Stahl
 Wardrobes. Article support for G. Gautier
 Washing compound and making the same A. W. Skinner
 Washing machine W. H. Heffernan et al
 Washing machine W. W. Allen
 Water elevator J. B. Neil
 Water lift. Pneumatic W. A. & B. S. H. Harris
 Water motor G. D. Fraser
 Water tube boiler O. Flamm et al
 Weather strip F. J. Boehler
 Weighing machine. Automatic W. F. & W. Braun
 Weight motor M. Brown
 Welding apparatus. Trough system for pipe C. Fell
 Wheel W. F. Grell
 Wheel W. Robinson
 Wheel attachment for sleds W. S. Howell
 Wind motor. Duplex O. Kirkham
 Window M. V. Avers
 Window cleaner T. U-ban
 Window screen H. J. Hauser
 Wire fabric H. E. Laughlin
 Wire screen. Adjustable A. J. Wivander et al
 Wire stretcher H. L. Ferris
 Wrench F. P. Worris
 Wrench J. R. Young
 Wrench A. S. Morange
 Wrench W. L. Chrysler et al

DESIGNS.

Badge W. S. Carter
 Fire indicator L. H. Britton
 Lamp shade W. R. Noe, Jr
 Lighting fixtures. Portable standard for 13 pats. H. T. Howell
 Phonograph horn M. Geller
 Trolley wire supporting bracket G. Nichols
 Umbrella, parasol or cane handle 2 pats. A. Rosenstein

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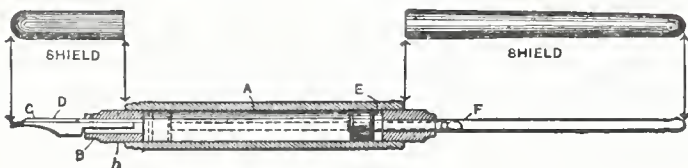
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WASHINGTON, D. C.---APRIL, 1907.

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ELECTRIC TOWAGE ON CANALS.

By L. RAMAKERS.



VIEW OF THE TELTOW CANAL (GERMANY.)

THE question of the traction of boats on rivers and canals is growing in importance as the demand for cheap transportation becomes more pressing. It is very much to be regretted that this means of carrying goods so valuable for its economy, should be so slow. The problem has received much attention in Europe, the continent of which is a network of canals. Germany has recently arrived at an interesting solution in the use of an electric tractor.

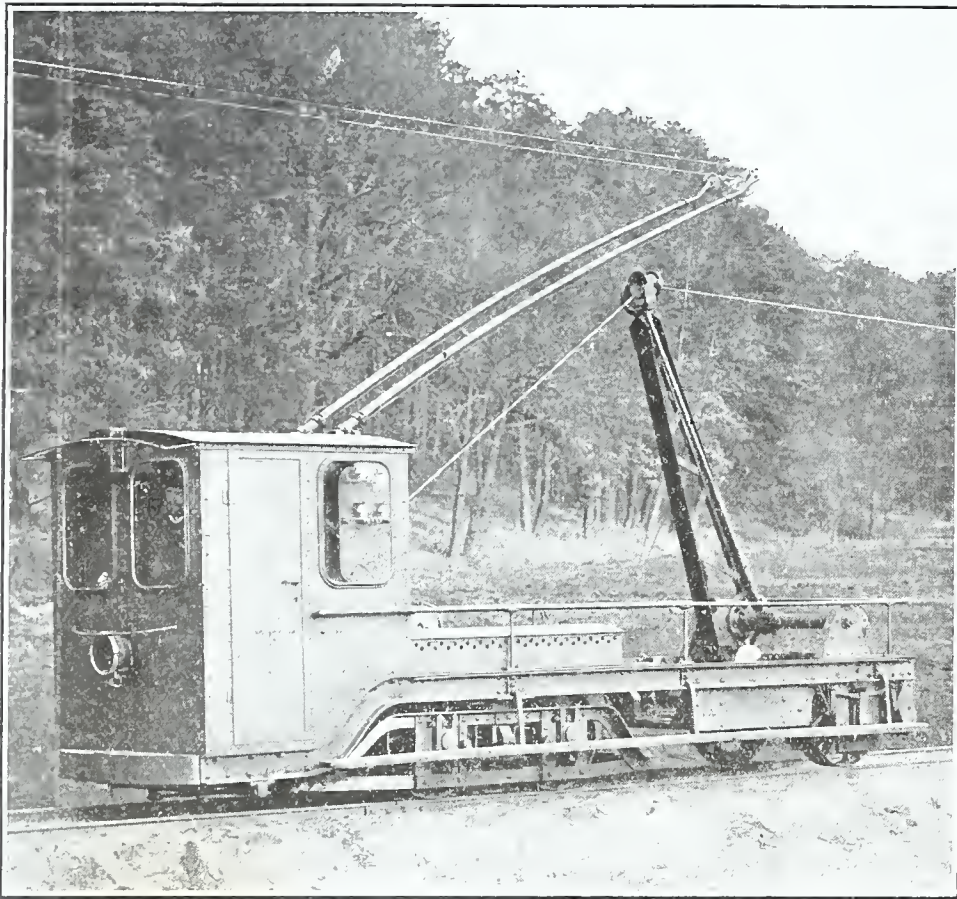
The experiments, which were made on the Teltow canal, were begun by operating the electric locomotive at a speed of 3 miles per hour, with two boats of different capacities, then with three boats, and finally with four canal boats. The towing rope was connected to the locomotive over a mast, and to the front canal boat at two points by a second rope, one end of which was connected near the stern and the other end just forward of the center.

It was found that for short lengths of towing, the resistance increased very rapidly and the difficulties of management were very considerable. The distance separating the different boats towed did not appear to have any influence on the resistance of traction.

By the use of the electric canal haulage locomotive, it is claimed that the cost per ton-kilometer is very much less than by steam tug haulage, while the speed is greatly increased. There is a considerable saving in fuel, and two men with electric haulage will do the same work as three men with steam power.

The canal is about 25 miles in length, and it required 9 hours and 30 minutes to make the trip from Potsdam, through Teltow, to Grenau. Direct current motors of 10 horsepower each were connected with both axles of the

haulage locomotive, through double reduction gearing. The electric locomotive (see Figure below) is provided with a rope drum, and an electric motor is utilized for winding up or unwinding the hauling rope. This towing rope passes over a frame truss which is 7 feet in length, and so arranged on the locomotive that it may be moved up and down in order that the rope may not interfere with other canal boats. For lowering and raising this truss, the second electric motor is employed.



ONE OF THE ELECTRIC LOCOMOTIVES USED ON THE TELTOW CANAL.

It is claimed that this locomotive tractor takes considerably less current than the electric tug boat which was previously tested on this canal, and a number of canal boats weighing 1,000 tons can be hauled with a consumption of about 20 kilowatts. A speed of about 2.1-2 miles per hour was attained with a consumption of 19 kilowatts, the locomotive hauling four boats of 1,450 tons, the tractive force being 1 ton when the boats were moving, and 2 tons at starting.

The traction engine bears the famous names of Siemens Schuckert. At a low speed the motors were in series, but when it was increased to 5 or 6 miles an hour the motors were connected in parallel, and the current required was found to be 8.5 amperes, the pressure on the line being 550 volts.

HIGH TEMPERATURES AND METAL WELDING.

Humanity, which swelters in a heat of ninety degrees and withers if the mercury runs up ten or fifteen degrees higher, finds it hard to realize a heat of 5,500 degrees. Yet that is the heat developed in certain chemical compounds, and that has also been attained by Sir Andrew Noble, in the explosion of cordite. This, the highest point of temperature in terrestrial thermometry, was gained by putting the cordite in closed vessels and exploding it, with a resulting pressure of 50 tons to the square inch and the degree of heat above noted. Incidentally, one result of this experiment should have been the formation of the diamond, and as a matter of fact, small crystals were found in the residues of the explosion chamber that seem to be actual diamonds. It appears, then, that if men cannot control the conditions that make for large diamonds, they at least understand them.

With the temperature noted, the limit of human attainment in this direction has been reached; and yet on the sun, which possesses temperatures transcending anything known on earth, the very elements of matter lie

disintegrated into simpler forms. And the sun is by no means the hottest of the heavenly bodies.

But a temperature that almost equals the dizzy height recorded has been attained by the union of elements which generate heat by chemical reaction. There are numerous combinations of this kind known to chemistry, among which one of the most efficient and practical, by reason of the intensity of the heat generated by the reaction and the abundance and cheapness of the requisite materials, is the union of oxygen with finely pulverized aluminum. On this is based the new science of aluminothermics, the most important commercial product of which is called thermit—a combination of finely pulverized aluminum with a mineral oxide, generally the oxide of chromium. When these substances are mingled and ignited, there ensues a chemical combination or combustion that, without the application of external heat, generates a temperature equal to that of the electric arc light, which is capable of fusing many metals, even when applied within a relatively small space. Aluminum and oxygen are among the most abundant of the primary elements, and the commercial

value of the discovery is limited only by the cheapness with which the two materials can be provided, and the field or range of purpose to which thermit can be applied.

Its chief application, so far, has been in the welding of machinery. This new agent makes it possible to mend iron castings weighing tons, which heretofore have had to be replaced at great expense of time and labor. It can also unite iron rails so perfectly that the jolting can scarcely be seen or felt, and a rail can be made miles long instead of fifty or a hundred feet. This welding can be effected either when the track is being laid down, or after it is finished and in use, and it is accomplished by applying an intense heat to the ends of the abutting rails.

One of the most important factors in a modern trolley line is a continuous rail. Heretofore, the rails of trolley lines have been connected to form a continuous circuit by means of bonds or ligaments, usually of copper. These were more or less unsatisfactory, since the skin resistance of copper bonds when buried, increases with age, which necessitates more or less frequent repairs. The welded rail, on the other hand, is not only a good electrical conductor, but has the additional advantage of smoothness and continuity, which obviates the clanking shock when the wheels pass over an imperfect joint, and the undue wear which comes upon the end of the rail where the wheels first strike it on passing from one rail to another.

In the practical application of this rail-welding process, two methods are employed, viz., with and without clamps. When clamps are used they are connected by strong set screws, and the process is as follows: The clamps having been screwed tight to the rails, a small crucible, made of sheet iron lined with magnesia, is suspended by a bracket support directly over the rail joint, which is enclosed in a mold or packing of fine clay to confine the fluid metal to the desired point of contact. All being in readiness, a charge of chromium oxide and pulverized aluminum is put into the crucible and ignited; the fire extends through the mixture, which fuses spontaneously with an intense heat, and, the bottom of the crucible being tapped, the molten, glowing liquid pours down into the space between the rail ends, melting to softness the metallic surfaces and producing a perfect butt weld, which is perfected by tightening the set screws and drawing the rail heads firmly together two or three minutes after the cast has taken place. The rails are thus rigidly and perfectly united, the only inequality being a slight rim or upset on the face of the rail, which is easily removed with a cold chisel or by filing. This was the method which was at first generally employed.

It was found that for practical purposes, the process could be much simplified and cheapened by dispensing with the use of clamps, as the time required for adjusting them and chiseling off the upset is thereby saved. The simpler method was first employed in a track laid down and embedded. The old fish plates were removed, the ends of the rails were

raised slightly by means of a crow bar, and a shim or bridge was firmly wedged in between. The molten thermit was then poured around the joint and the shim was welded into the head of both rails. In welding without clamps new rails not yet fastened down or embedded, the weld can be perfected by wedging back the rail from the next succeeding joint. The time saved on each joint by dispensing with clamps is found to be about three quarters of an hour for each workman.

The conditions to be observed are that the rail heads to be joined must be cleaned of rust and dirt with a wire brush, and slightly warmed. The rails should then be perfectly aligned and surfaced, as otherwise the defective alignment will be made permanent by welding. No fish plates, and consequently no bolt holes, are required. The welding is done automatically by the thermit itself, and does not require the skillful supervision of an expert welder. The mold which fits around the rail and is tightly screwed to it must be dry and porous, and if the operation is continued in wet weather, a small movable tent or other shelter is requisite to protect the mold and molten thermit from contact with water.

The crucible in which the thermit is smelted is simply made by lining a sheet iron cup or vase with magnesia, that is introduced by tamping around a conical core suspended in the middle of the metallic shell. The bottom of the crucible is a disk of magnesia stone pierced with an orifice to permit the outflow of the contents when fusion is complete. After the magnesia lining has been tamped in, the crucible, with the core still in position, is heated in an oven for two hours to a glow heat. It is then cooled, the core is withdrawn, and the crucible—which will stand on an average of 25 thermit reactions—is ready for use again. Thermit is put up in small bags, each containing a charge of the quantity necessary to weld a rail joint, and in this form is sold to railway and street car companies, which generally make their own crucibles and molds and have the welding done by their own workmen.

When an exposed third rail is used for current transmission, this process is also employed; but instead of a complete butt weld it is sufficient to weld a small shim or bridge of thermit iron between the flange ends on one side of the rail, which greatly simplifies the process and secures a satisfactory joint for electrical purposes.

As above noted, another and not less interesting use of thermit is for welding and repairing broken parts of heavy machinery, such as shafts, driving wheels, and the stern posts and other parts of vessels which can not be easily removed for ordinary repair. When the problem is to mend a broken shaft, no crucible is necessary, but a mold is made with a chamber into which the charge is put, and when molten, flows by gravity down into the fracture and completes the weld.

Thermit, with an addition of one-tenth carbon, gives 50 percent of mild, overheated steel, which can be hardened when necessary by the addition of manganese. It offers therefore to the foundryman, the machinist, or the engineer a supply of liquid steel which can be created and used on the spot in any desired quantity, not only to weld rails and other forms of metal in construction, but to correct faulty castings, and by uniting broken or worn out parts, to accomplish cheaply, far from a factory or machine shop, repairs which would otherwise be tedious, and in some cases impossible.

It will be seen that thermit is full of engineering possibilities, and its discovery, unlike so many scientific discoveries, is not merely interesting to the scientist, but is commercially valuable in the industrial world.

ELECTRICITY IN THE HOUSEHOLD.

By FRANK C. PERKINS.

THE modern home is not complete unless it is wired throughout for electric current, as there are no labor saving devices of greater importance at the present time than those now available for operation by electricity in the household. A house newly constructed which is not wired for electric lights, with convenient receptacles for heating devices, electric cooking apparatus, fan motors, and other electric motors, to be used on the electric lighting circuit, can hardly be said to be up-to-date.

Electric lighting and power companies realize that a day load in residences is of great importance and rates as low as five cents per kilowatt have been made for electric cooking, heating, ironing, and motor service.

In Germany, as well as in America, electrically operated labor saving devices are being extensively employed in the household.

The accompanying illustration, Fig. 1, shows a German electric sewing machine motor, while Figs. 2, and 3, show the application of electric power to the dish washing machine, as well as meat and vegetable cutters for slicing beets, turnips, and cabbages, the latter for making sour kraut, the favorite German dish.

In the United States, there are modern residences equipped with every conceivable device known to the electric engineer, for making the home more pleasant and agreeable to the owner, as well as to the domestic servants.

A complete equipment is contained in the residence of W. H. Hillman, at Schenectady, N. Y.

In the dining room electric circuits are provided for using the electric

chafing dish, the coffee percolator and the water heater in the kitchen, and electric cooking and electric knife sharpeners and coffee grinders can be employed to advantage. In the laundry the electric flat iron is available, and an electric washing machine motor does its work with rapidity and satisfaction.

These electric labor saving devices greatly lighten the work of the house wife and the domestics. In the den and on the piazza, outlets are provided for electric cigar lighters, and in the bath room electric water heaters are available as well as the heating bath, the massage motor, and the electric shaving cup.

In the sewing room the electric sewing machine

motor furnishes the necessary power, and for pressing the newly made garments, a small electric flat iron is available.

In the bed chambers electric outlets are provided for electric heating bath, electric curling iron and baby milk warmers, while throughout the entire home, electric lights are well arranged and electric heating devices, electric radiators of various types and electric fans are employed, the radiators being

of the luminous type, in the living room.

Many modern conveniences are now available for the home provided with cheap electric current, such as the immersion heater and electric wash boiler in the laundry, electric ovens, pan cake griddles and broilers in the kitchen, and the electric chafing dish in the dining room.

Electricity for household purposes possesses many distinct advantages, not only for lighting but for fuel and heating. The effect is instantaneous in almost every case, even in the luminous heater. The radiation is accompanied with no offensive or unhealthy odors, and when properly installed no danger can accrue from its continuous operation. Statistics are conclusive on this point. The luminous heater may be left for hours without attention, can be regulated at will,

and no expense is incurred when current is not required. Rooms not in constant use may thus be entirely shut off.

Many manufacturers are now unusually active in designing and manufacturing motors and other devices for household purposes. The skill and genius of many engineers is being concentrated in this direction in an endeavor to produce such utensils as will embrace the many requirements necessary for the kitchen, chamber and laundry.

In Switzerland, many homes are provided with electric current, even in the smallest country towns, and it is used extensively for lighting with motors for domestic service.

The general use of electricity will unquestionably be much more rapid for heating and cooking than it has been for light. The doubt and antipathy with which it was originally regarded is fast disappearing. The fundamental principles governing its operation are becoming more widely understood and being turned into innumerable channels. It must therefore be apparent that its utility in the home will be one of the wonders of the age.

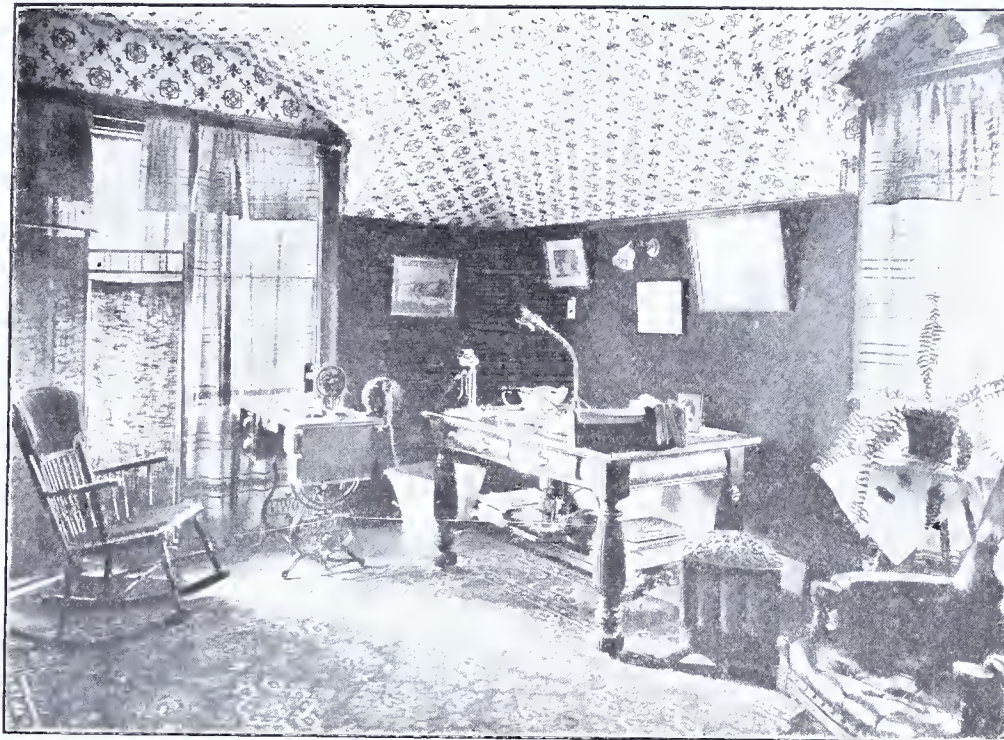


FIG. 1.
VIEW OF SITTING ROOM, SHOWING LUMINOUS RADIATOR, ELECTRIC IRON AND SEWING MACHINE MOTOR.



FIG. 2.
GERMAN ELECTRIC DISH-WASHING MACHINE.



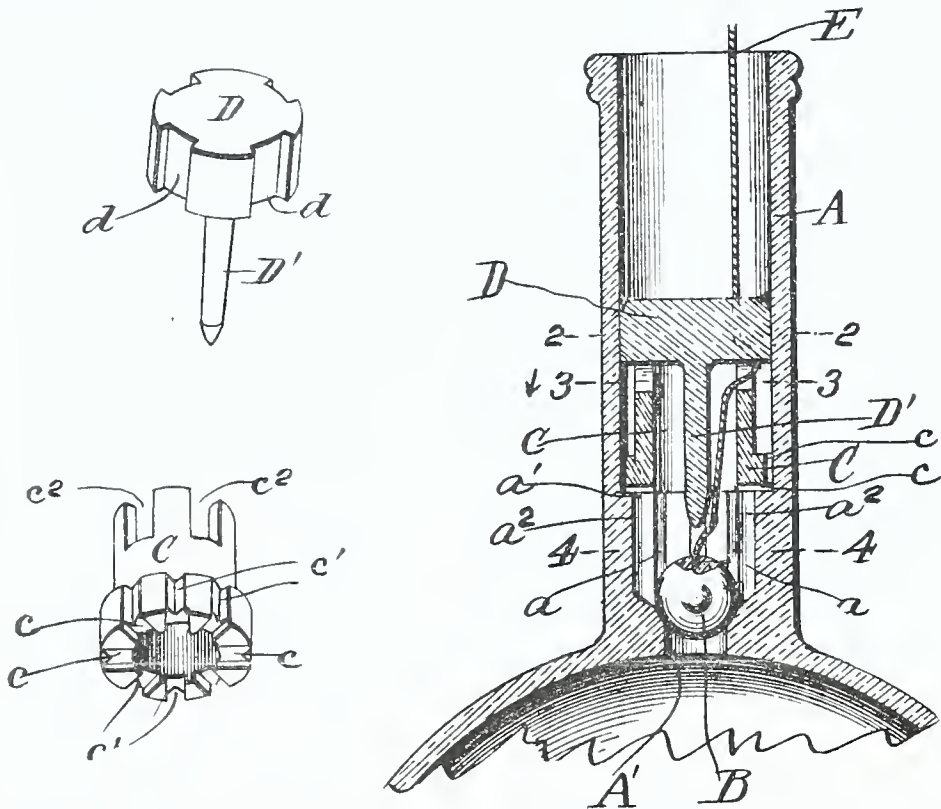
FIG. 3.
GERMAN ELECTRIC MEAT AND VEGETABLE CHOPPER.

CLEVER NEW PATENTS.

NON REFILLABLE BOTTLE.—SAW FILING MACHINE.—COTTON STALK PULLER.—ADDING MACHINE.

Non-Refillable Bottle.

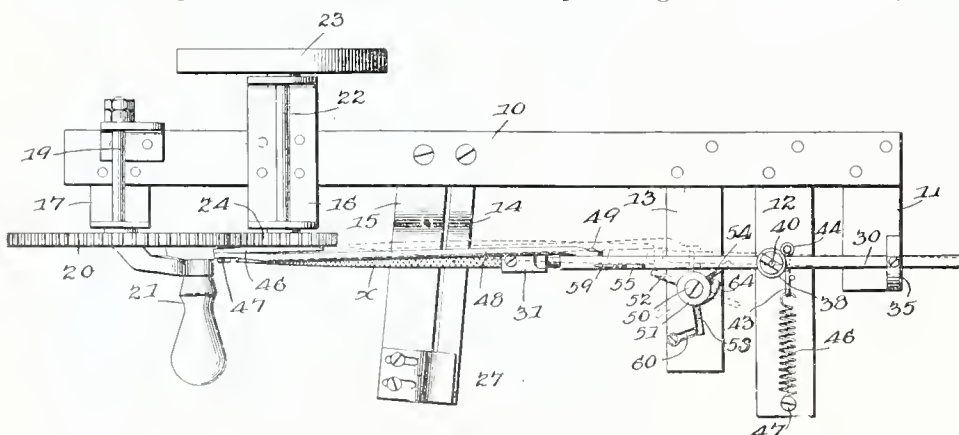
Valentine Clark, of Dryad, Washington, has patented a non-refillable bottle designed to prevent the clandestine and fraudulent refilling of bottles by unauthorized or unscrupulous persons. The neck of the bottle has an opening at its lower end with a valve seat above this opening. A plurality of longitudinal ribs *a*, are located above the valve seat and define between them longitudinal grooves *a*². An open-ended cylinder *C* rests upon the ribs, and has radial grooves in its lower edge and vertical grooves in its circumference. These grooves are in communication with each other. A top guard member *D* is located over the cylinder, and consists of a head having a central downwardly extending stem *D*¹, that projects into the cylinder, said member having vertical grooves or passages in its circumference. A ball valve *B* is located in the neck of the bottle below the stem, and is arranged to rest upon the valve seat so as to control the opening between the bottle neck and the body of the valve.



In practice, the bottle is filled before the various parts are introduced into the neck, and then the said parts are positioned and the guard *D* cemented in place. It will be noted that by filling the bottle sufficiently, the ball valve will leave its seat and roll along on the ribs *a*, being restrained from rolling too far by the end of stem *D*¹. The liquid can now pass freely from the bottle into the grooves between the ribs *a*, some going through the center of cylinder *C* and out of the slots *c*², and some passing through the radial grooves *c*, then between cylinder *C* and the inner end of the bottle neck and out through the grooves or passages *d* of the head *D*. If, however, it is attempted to introduce liquid into the bottle after the same has been emptied, the various passages constitute effective obstructions thereto, and besides the ball valve will seat itself.

Saw Filing Machine.

The saw filing machine disclosed in the accompanying illustration is the patented invention of Mr. Cicero J. Tatum, of Port Arthur, Texas, and he has assigned a one half interest in his patent to Lemuel E. Dunn, of the same place. The machine consists of a main frame comprising a bar 10, from which projects a series of arms. On certain of these arms is a reciprocatory bar 30 constituting a file carrier having a chuck 31, in which the file *x* is secured. A handle 21 is geared as shown at 20 and 24 to a crank 46, and a pitman 48, connected to the crank, has a connection with the file carrier 30. The carrier furthermore is provided with an arm 55 cooperating with the arms 52, 53 and

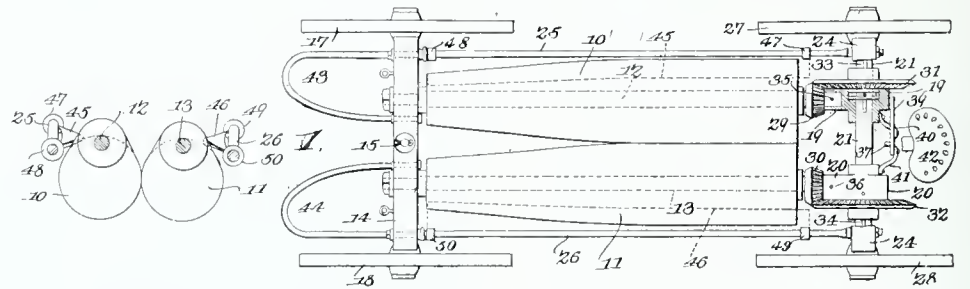


54 of a rotatable spider, the arrangement being such that as the file is reciprocated, the spider will move it laterally and thereby feed the saw. The lateral movement is opposed by a spring 46 which returns the file after each movement. As a result, a machine is produced in which the file carrier permits the movement of the file against each tooth of the saw for a sufficient number of file strokes to accomplish the sharpening operation; and further-

more constitutes means for automatically feeding the saw by means of the file, the latter being so arranged that at the completion of each tooth sharpening operation, it will advance the saw to the extent of a single tooth or two teeth, as may be required by the character of the saw to be sharpened.

Cotton Stalk Puller.

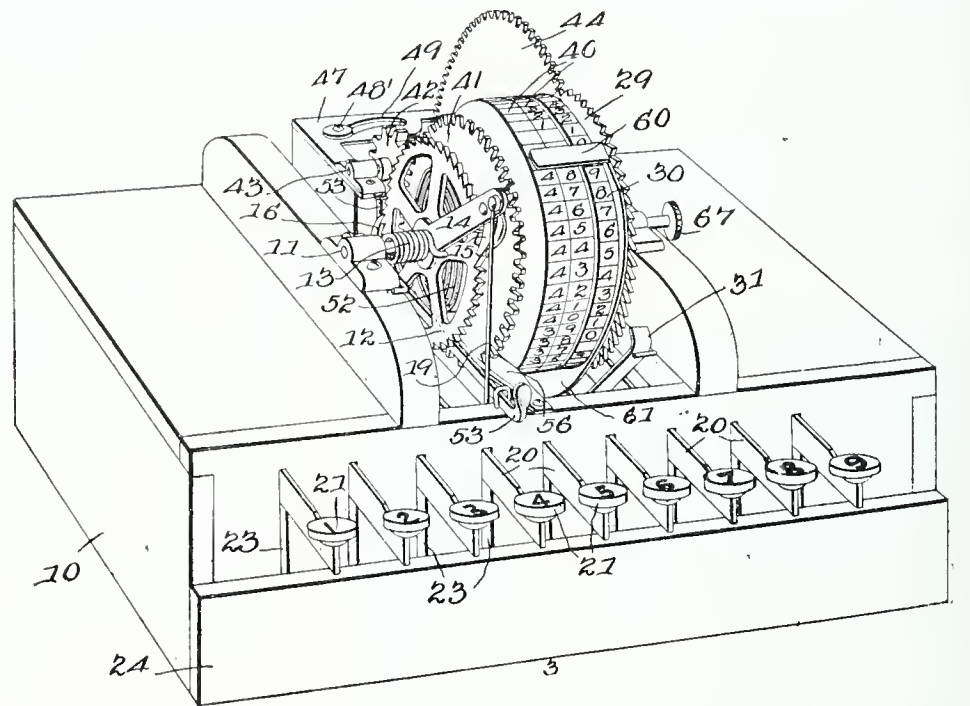
A stalk puller intended more particularly for pulling cotton stalks and the like from the ground has been patented by Mr. Columbus J. Richardson, of Caldwell, Texas. As shown in the accompanying illustration, a frame is employed, mounted on wheels. In this frame is journaled a pair of opposing rollers 10 and 11 having their axes of rotation substantially parallel, the said rollers being inclined rearwardly and downwardly. The rollers taper from the front to the rear ends, so that the forward ends are spaced apart while the rear ends are in contact. In advance of the rollers are gathering or guide



rods 43 and 44. The rear ends of the rollers are geared to the rear axle, and the rear wheels 27, 28 thus constitute traction wheels. A driver's seat 42 is mounted on the rear end of the machine. It will be evident that when the machine is drawn forward, the motion of the wheels is transmitted through the gearing to the rollers, and the stalks, guided by the front rods 43 and 44, are caught between the rollers and pulled out of the ground. As shown in the detail view, scrapers 45, 46 are applied for removing any adhering matter from the rollers.

Adding Machine.

Mr. Stephen H. Drysdale, of Versailles, Mo., has patented an adding machine that has several unique features. The device is particularly intended for adding single columns of figures, and includes totalizing disks on which the numerals are grouped, each group including the nine numerals and naught, and the groups being divided from each other by a blank space equal to that occupied by one numeral, provision being made for indicating the correct reading point. The totalizing mechanism is furthermore so arranged that the movement of the units disk is continuously transmitted to a tens or higher disk, and the totalizer indicator is employed in connection therewith, and moves with the tens or higher disk in order that the correct total may be ascertained. A reading indicator 60 is also provided that is moved with one of the disks until a sum exceeding nine is to be transmitted from a lower



disk to a higher disk, and then it is moved a step backward to display a higher numeral on the second or higher disk. The keys and key levers are precisely the same construction so that the cost of manufacture is reduced, and all the levers have the same stroke regardless of the values which they represent. Novel mechanism is employed for preventing the excess movement of the disks under any momentum caused by the sudden depression of the keys, and means are also provided for restoring the parts to zero position at the completion of each operation.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

BROOKFIELD et al. v. ELMER GLASS WORKS.

(Circuit Court, D. New Jersey, March 28,
1906. 144 F. R. p. 418.)

PATENTS—INFRINGEMENT—PRESS FOR FORM- ING SCREW INSULATORS.

The Kribs patent, No. 542,565, for a press for making screw insulators, claims 2 and 3, cover a combination of old elements, and are not infringed by the machine of the Duffield patent, No. 723,589, which does not contain all of such elements. Held, infringed, however, by modified form of the Duffield machine used by defendant.

BENBOW-BRAMMER MFG. CO. v. HEFFRON-TANNER CO.

(Circuit Court, N. D. New York, March 27,
1906. 144 F. R. p. 429.)

1. PATENTS—INFRINGEMENT—WASHING MA- CHINES.

The Schroeder patent, No. 535,465, for means for operating washing machines was not anticipated, and is valid. Also held infringed.

2. SAME.

The giving away of infringing articles as premiums with other goods sold is in effect a sale, and constitutes infringement.

CHASE ELECTRIC CONST. CO. v. CO- LUMBIA CONST. CO. et al.

(Circuit Court, E. D. Pennsylvania, March
31, 1906. 144 F. R. p. 431.)

PATENTS—INVENTION—ELECTRIC SIGNS.

The Chase patent, No. 626,667, for an improvement in electric signs in which letters formed with electric lamps are used, having a baseboard on which the letters are mounted with slots therein, through which the connecting wires are passed, and means whereby the letters may be readily and speedily removed and changed, construed, and held not anticipated and to disclose invention; also held infringed.

THOMSON-HOUSTON ELECTRIC CO. v. GARRETT COAL CO.

(Circuit Court, W. D. Pennsylvania, April
5, 1906. 144 F. R. p. 434.)

PATENTS—INFRINGEMENT—ELECTRIC MOTOR REGULATORS.

The Knight reissued patent, No. 11,915 (original No. 425,169), for an electric motor regulator consisting of an interlocking device for use on that class of electric motors, in which different levers are used for controlling and reversing the current by which each lever is locked by the other, except when the other is in a predetermined position, is limited by the narrower claims, the reissue to the specific mechanical means shown, or their equivalents. As so construed, held not infringing.

NEW JERSEY PATENT CO. et al. v. SCHAEFER.

(Circuit Court, E. D. Pennsylvania, April 5,
1906. 144 F. R. p. 437.)

PATENTS—INFRINGEMENT—VIOLATION OF CONDITIONS OF LICENSE.

One who knowingly buys and sells patented articles in violation of restrictions placed on their sale by the owner of the patent, fixing a minimum price at which they shall be sold as a condition of the license to use or sell, is chargeable with infringement of the patent.

GENERAL ELECTRIC CO. v. WESTING- HOUSE ELECTRIC & MFG. CO.

(Circuit Court, N. D. New York, April 4,
1906. 144 F. R. p. 458.)

1. SPECIFIC PERFORMANCE—CONTRACTS— MANUFACTURE AND SALE OF SPECIFIC ARTICLES—CONTINUING CONTRACTS.

A contract to remain in force for 15 years provided that defendant should not manufacture certain electric controllers for use in the United States; that complainant would sell and deliver such controllers to defendant at specified prices; that defendant would sell them to the exclusion of all others of the same kind, and that complainant would sell defendant's overhead trolleys

to the exclusion of all others; and that if complainant failed to supply defendant with controllers pursuant to contract, defendant might manufacture them. Held, that it was not a contract of which equity would compel specific performance.

2. INJUNCTION—MUTUALITY OF REMEDY.

There being no mutuality of remedy, complainant could not, in effect, enforce specific performance by an injunction restraining defendant from making and selling similar controllers in violation of its agreement.

3. SAME—ADEQUATE REMEDY AT LAW.

Where a contract for the manufacture and sale of electric equipment provided that in case either party violated the same, it should pay as liquidated damages and not as a penalty 50 per cent. of the price at which the appliances referred to were at the time being regularly sold to users, performance at all events was not contemplated by the parties, and complainant was not entitled to an injunction to restrain defendant's violation of the contract, on the ground that complainant had no adequate remedy at law.

4. SAME—ACCOUNTING—DISCOVERY.

Where a contract for the manufacture and sale of electrical appliances provided that in case of violation, the party guilty should pay the other as liquidated damages 50 per cent. of the price at which the appliance in question was being regularly sold at the time, an injunction restraining the violation of such contract could not be allowed for the reason that the damages were difficult of ascertainment, complainant being entitled to a discovery of sales made by defendant, in violation of the agreement in an action at law, as authorized by Rev. St. U. S. § 724 [U. S. Comp. St. 1901, p. 583.]

5. COURTS—FEDERAL COURTS—PRACTICE— DEMURRER—CONCLUSIONS OF LAW.

The rule that a demurrer does not admit legal conclusions pleaded obtains in the federal courts.

6. INJUNCTION—GROUNDS—MULTIPLICITY OF SUITS.

Where a contract bound defendant not to manufacture certain electrical controllers except on complainant's failure to furnish similar controllers at certain prices, and declared that in case of violation thereof, defendant should pay as liquidated damages, and not as a penalty 50 per cent. of the price at which such controllers at the time were being regularly sold to users, complainant was not entitled to an injunction to restrain a violation of such contract, in order to avoid a multiplicity of actions at law for damages.

GENERAL ELECTRIC CO. v. PITTS- BURG-BUFFALO CO.

(Circuit Court, W. D. Pennsylvania, April
5, 1906. 144 F. R. p. 439.)

PATENTS—SUIT FOR INFRINGEMENT—PRE- LIMINARY INJUNCTION.

A preliminary injunction to restrain infringement of a patent will not be issued, where defendant admits the use of the alleged infringing device, without knowledge of complainant's rights, but alleges that such use has ceased, and the court is assured that it will not be resumed.

HAGGARD et al. v. WAVERLY PUB. CO.

(Circuit Court, D. New Jersey, January 30,
1895. 144 F. R. p. 490.)

COPYRIGHT—SUIT FOR INFRINGEMENT—COPY- RIGHT NOTICE IN FOREIGN PUBLICATIONS.

A bill for infringement of copyright of a book held good on demurrer, although it failed to allege that the copyright notice required by Rev. St. 4962, had been printed in all editions of the book published in foreign countries; the question of the effect of such omission on the rights of complainant being reserved for determination after full hearing on the facts.

HARPER & BROS. v. M. A. DONOHUE & CO. et al.

(Circuit Court, N. D. Illinois, E. D. Dec. 29,
1905. 144 F. R. p. 491.)

1. COPYRIGHT—RIGHT OF PUBLISHER—CON- STRUCTION OF CONTRACT.

By a contract an English author granted to American publishers the exclusive right to publish a work in the United States, reserving the right of translation and dramatization. The publishers agreed to take all steps necessary under the United States copyright law "to secure their own rights and those of the author in said work." It was also provided that, should the book remain out of print for six consecutive months,

the right to publish in book form should revert to the author. Held, that the publishers rightfully took out the copyright in their own name, as the only means by which they could protect their own rights in the work.

2. SAME—PERIODICAL—COPYRIGHT OF NUM- BER PROTECTS ALL CONTENTS.

Under Copyright Act March 3, 1891, c. 565, § 11, 26 Stat. 1109 [U. S. Comp. St. 1901, p. 3417], which provides that "each number of a periodical shall be considered as an independent publication subject to the form of copyrighting as above," the copyrighting of a number of a periodical as a whole, with notice of such copyright given on the title page or the page following, covers and protects all the articles printed therein.

3. SAME—ABANDONMENT AND FORFEITURE— FOREIGN PUBLICATION.

A United States copyright of a work of an English author by the American publishers is not abandoned or forfeited because of the foreign publication of the work by, or with consent of, the author, without the copyright notice, and without consent of the owners of such copyright.

4. SAME—INFRINGEMENT—REPUBLICATION OF BOOK IMPORTED IN VIOLATION OF STATUTE.

The English author of a novel, by contract, authorized its publication in Great Britain, and also by a separate contract gave the exclusive right of publication in the United States to a firm of American publishers, and the latter copyrighted the work in this country. The English publication was made from type there set and contained no notice of the American copyright. Defendants imported a copy of such publication and proceeded to republish the same in the United States. Held, that such book having been imported in violation of Rev. St. 4956, as amended by act March 3, 1891, c. 565, 26 Stat. 1107 [U. S. Comp. St. 1901, p. 3407], defendants could found no rights thereon, and that their publication was an infringement of the copyright and would be enjoined.

UNITED STATES TOBACCO CO. v. McGREENERY et al.

(Circuit Court, D. Massachusetts, March 23,
1906. 144 F. R. p. 531.)

1. TRADE-MARKS—INFRINGEMENT—DECEP- TION OF BUYERS—EVIDENCE.

Evidence examined, and held insufficient to show that buyers were deceived by the defendant's use of any feature of the complainant's label on tobacco packages which was peculiar to the complainant and which the defendant has no right to use.

2. SAME—FRAUD.

While fraud alone is not sufficient to entitle the complainant to a decree restraining unfair competition, yet it is a fact to be taken into consideration by the court.

3. SAME—DECEPTION OF PUBLIC—MEANS.

A dealer may lawfully seek to enlarge his custom by selling cheaper than a rival packages of tobacco put up in an old form even though they deceive a careless public, but he may not lawfully seek to obtain the rival's custom by deceiving the public through the appropriation of some characteristic of the rival's package which was new in the art, and is the rival's peculiar property.

DE LONG HOOK & EYE CO. v. FRANCIS HOOK & EYE & FASTENER CO.

(Circuit Court of Appeals, Second Circuit,
March 7, 1906. 144 F. R. p. 682.)

TRADE-MARKS AND TRADE NAMES—UNFAIR COMPETITION—SIMILITUDE IN DRESS OF GOODS.

Certain forms and styles of eards, used by defendant and containing hooks and eyes of its manufacture as dressed for market, held not to have such similitude to those of complainant as to constitute infringement or to make a case of unfair competition, and others held to infringe.

WESTERN ELECTRIC CO. v. GALES- BURG UNION TELEPHONE CO. et al.

(Circuit Court of Appeals, Seventh Circuit,
January 26, 1906. 144 F. R. p. 684.)

PATENTS—INFRINGEMENT—TELEPHONE SWITCHBOARDS.

The Scribner patent, No. 669,708, for apparatus for telephone switchboards, the principal feature of which is the use of electric lamps as signals to indicate whether a line with which connection is made is free or busy, together with the mechanical means shown for operating such signals, construed, and, as limited by the prior art, held not infringing.

RYAN v. METROPOLITAN JOCKEY CLUB et al.

(Circuit Court of Appeals, Second Circuit,
March 2, 1906. 144 F. R. p. 697.)

PATENTS—INFRINGEMENT—STARTER'S GATE FOR RACE TRACKS.

The Ryan patent, No. 550,740, for a starter's gate for race tracks, claim 1, is clearly limited to a gate pivoted so as to swing down between the supports and to latches for holding it between the supports when depressed, and is not infringed by a device having neither of such features.

MILLS v. RUSSELL MFG. CO.

(Circuit Court of Appeals, Second Circuit,
March 7, 1906. 144 F. R. p. 700.)

PATENTS—INFRINGEMENT—CARTRIDGE BELTS.

The Mills patents, Nos. 756,177 and 756,178, for cartridge belts, held not infringed.

COLUMBUS et al. v. FERNO CO. et al.

(Circuit Court of Appeals, Second Circuit,
March 23, 1906. 144 F. R. p. 701.)

PATENTS—INFRINGEMENT—GAS HEATERS.

The Carter patent, No. 373,255, for a gas heater, held not infringed.

EDWARD & JOHN BURKE, Limited v. BISHOP.

(Circuit Court of Appeals, Second Circuit,
March 29, 1906. 144 F. R. p. 885.)

TRADE-MARKS AND TRADE-NAMES—SUIT FOR UNFAIR COMPETITION—PRELIMI- NARY INJUNCTION.

A complaint in a suit for unfair competition is not entitled to a preliminary injunction, where the real defendant, who is defending although not nominally a party, has been openly and notoriously carrying on the competition complained of for more than 10 years in the same city with complainant and with its knowledge, and no such relief has been previously asked for.

STIRLING CO. v. RUST BOILER CO.

(Circuit Court W. D. Pennsylvania, Feb. 26,
1906. 144 F. R. p. 842.)

PATENTS—INFRINGEMENT—STEAM BOILERS.

The Faber patent No. 680,707, for a water tube steam boiler, the specific purpose of the invention being to create and maintain sectional currents, construed and held not infringing.

STIRLING CO. v. RUST BOILER CO.

(Circuit Court, W. D. Pennsylvania, Feb.
26, 1906. 144 F. R. p. 849.)

1. PATENTS—INFRINGEMENT—STEAM BOILERS.

The Schlieper patent, No. 526,947, for a water tube steam boiler covering an alleged improvement of the Stirling boiler is of narrow scope and is not infringed by a boiler constructed under the Rust patent, No. _____.

2. SAME—CONSTRUCTION OF CLAIMS.

In the construction of a patent the omission of the patentee to point out or refer in his specification or claims to a special feature which he subsequently maintains is the most important part of his invention, is very significant, and should be carefully scrutinized.

SALEM ELECTRIC CO. v. THOMSON- HOUSTON ELECTRIC CO.

(Circuit Court of Appeals, Third Circuit,
April 30, 1906. 144 F. R. p. 974.)

The Thomson & Rice patent, No. 413,293, for a system of electrical distribution especially adapted to lighting purposes, and having for its objects to run lamps or other translating devices in series and in multiple on one and the same system, and from one and the same source of supply, embodies a combination or aggregation of elements, all of which were old, and each of which performs only its old function, and in view of the prior art, and especially of the Edison municipal system, is void for lack of patentable invention.

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WEST BOYLSTON MFG. CO. et al. v. WALLACE.

(Circuit Court of Appeals, First Circuit,
January 25, 1906. 144 F. R. p. 979.)

PATENTS—NOVELTY—TENTING CLOTH.

The Mitchelson patent, No. 718,499, for tenting cloth, for use in covering tobacco fields, etc., is void for lack of patentable novelty.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

William H. Rishel, Danville, Pa. Boltless Rail Chair.—The primary object of this invention is to provide a rail chair capable of firmly and securely connecting the meeting ends of rails, without employing bolts and nuts. The rail chair is also adapted to permit the rails to expand and contract without affecting the securing means. It consists of a pair of upwardly converging jaws, arranged to engage the rails beneath the heads thereof, and a rail-receiving hanger connected with the engaging edges of the jaws and provided at the bottom with a rail seat, spaced from the bottoms of the jaws. The pressure of the wheels of a train on the rails causes the upwardly converging jaws to firmly grip the rails, and the gripping action varies with the pressure to which the rails are subjected.

Martin T. White, Chestnut Bluff, Tenn. Commode.—It is the aim of the present invention to provide a commode having a bead rest for the patient, capable of adjustment to enable the head to be supported in a comfortable position. The device, which is especially advantageous for sick, infirm and helpless patients, is adapted to be arranged with one end close to a bed, in convenient position for a patient to straddle it, and it will require but little effort for him to move, or be moved forward onto the device, or backward therefrom to the bed. It consists of a top or seat having a commode opening, front and rear legs supporting the top or seat, and a combined support and brace spaced from the top or seat to receive a vessel. The head rest extends upwardly from the front end of the top or seat, and it is adjustably secured to the front leg.

John B. Aikin, Wilmington, Ohio. Sure Catch Latch for Gates, Doors, etc.—The latch of the present invention is designed for use on farm gates, yard gates, barn doors, out buildings, etc., and is adapted to support the free end of a gate or door, when the same is closed, to prevent such door or gate from settling or sagging. The latch is also adapted to prevent any accidental rebound of a gate or door, when the same is quickly closed or slammed, and when operated to unfasten a gate or door, it will start the opening movement, and thereby obviate the necessity of holding the latch in its unlocked position in one hand, and opening the gate or door with the other hand. The latch has a body provided with a projecting guiding portion having an inclined upper edge. The body projects upward at the inner end of the guiding portion, and has a recess thereat, forming an over-hanging portion extending over a stud or member carried by the gate. The stud or member of the gate is locked in the recess of the body by a pivoted latch, which is provided with an engaging portion or hook. The over-hanging portion of the body forms a stop for holding the stud or member of the gate against upward movement, so that an upward pressure on the gate cannot lift the latch.

John M. Brasington, Bennetttsville, S. C., inventor; T. E. & C. S. McCall, Jr., Bennetttsville, S. C., assignees. Fertilizer Distributors. Two patents. The first patent covers a fertilizer distributor capable of distributing guano or other fertilizer as uniformly on hilly ground, where it is in an inclined position, as on level ground, where it is in an upright position, whereby a great saving in the fer-

tilizer is effected. The means for preventing the fertilizer from accumulating on, and discharging wholly at, the lower side of the shoe, when the fertilizer distributor is operating on hilly ground and is in an inclined position, consists of a shaking shoe provided at its bottom with longitudinal corrugations, forming grooves or gutters, and adapted to cause the fertilizer to be discharged from the shoe in a series of fine streams. The fertilizer distributor is also provided with a feed operating device, having cutting means opposed to the action of the shoe for chopping the fertilizer.

The improvement covered by the second patent relates to the hopper and the shoe, and is designed particularly for distributing guano in the cultivation of cotton. It is adapted to discharge the fertilizer in two broad streams at each side of the center of the furrow, in which the cotton seed is planted, whereby the soil is fertilized without liability of the guano coming in contact with and injuring young cotton plants, as they sprout from the soil. Means are also provided for preventing light fertilizer from being blown from the row operated on. The machine embodies a hopper, having a discharge outlet at one side of the center, and a distributing shoe having opposite sides, and a connecting inclined bottom portion provided with a rib for dividing the fertilizer. The rib, which is provided with oppositely inclined sides, extends along the bottom of the shoe from a point beneath the outlet to the median line of the shoe, and is arranged at an angle to the same.

Limvel R. Greer, Albion, Ark., inventor; Emmet Snipes, Searcy, Ark., assignee. Cultivator Attachment.—Heretofore considerable difficulty has been experienced in scraping or plowing young cotton plants and corn with straddle row cultivators, having independently adjustable beams, as the blades are liable to slip and accidentally injure or destroy the young plants, and it has been practically impossible for boys to perform this labor. It is the aim of the present invention to provide an attachment adapted to be readily applied to a cultivator at different elevations to clear the plants under cultivation, and capable of spacing the cultivator beams the desired distance apart, and of maintaining the beams in such spaced relation, whereby the cultivator may be easily guided and controlled. The device embraces two slidably and adjustably connecting sections, having terminal attaching means consisting of loops for engaging the opposite portions of a cultivator, spaced projecting portions carried by the loops, and tapered tongues extending from the adjustable sections and pivotally connected with the spaced projecting portions of the loops. This attachment permits a limited independent movement of the beams of a cultivator, so that the cultivating device of one beam may be worked slightly in advance of those of the other beam.

Alva J. Carter, Sioux City, Iowa. Telephone Testing Set.—This invention was designed with special reference to telephone exchange work, but is capable of being utilized for general test purposes in connection with telephone, telegraph, or other electrical systems. The entire device is simple and inexpensive, and is arranged in very small compass. The usual batteries, transmitter and similar appurtenances liable to damage and derangement by the rough usage which portable test sets usually receive, are entirely eliminated. The set includes the electrical connections, a generator for inducing an alternating current, means including a shunt circuit for commuting the alternating current to produce a direct pulsating current, a receiver, a signal device, and switch mechanism including a pair of

switches, one of the switches serving to open or close the shunt circuit or to connect the signal device in multiple with the generator, and the other switch serving to connect the receiver with the generator to connect the signal device and generator in series or in multiple. By means of this arrangement all of the usual tests can be conducted with facility and dispatch.

Arthur Symes, inventor, Racine, Wisc.; Automatic Shelving Co., assignee, River Falls, Wisc. Display Apparatus.—This patent discloses a display apparatus of that type in which an endless carrier conveys and exhibits a moving display. One of the novel features is the mounting of the endless side sections or carriers of the conveyer upon idlers which are independently revoluble. Rotary drivers engage shelf or platform hangers which project from these carriers, and the capability of the idlers for independent movement serves to insure proper action of the carriers without material friction. Another feature is the association of an endless controller with the traveling shelving. This controller is mounted to travel around idlers and is positively driven so that the proper movement in unison with the carriers of the controller will be insured, notwithstanding uneven stretching or elongation of these carriers in the course of use. By means of a novel connection between the shelf hangers and the controller, the shelves are constantly maintained in predetermined positions during their travel, and slight irregularities of movement are compensated for. The entire mechanism is mounted in a light framework of skeleton form which may be suspended from the ceiling, carried by wall brackets, or encased in a cabinet, and it is capable of being disposed vertically, horizontally or at any desired inclination.

Ira A. Butcher, inventor, Ottumwa, Iowa.; Lewis H. Livingston, Enid, Okla., and W. M. Sasher, Hennessey, Okla. Ter., assignees. Grain Separator.—This patent covers certain improvements in a separator patented by Mr. Lewis H. Livingston in 1902. The object in view is to provide a novel combination of elements which will more thoroughly separate the grain from the straw, and pass the latter rapidly from the straw carrier without causing it to clog or otherwise obstruct the efficient action of the separating mechanism. Means are also employed for permitting the passage of the grain to the grain pan, said means being adjustable to conform to the condition and kind of material being acted upon. The inventor employs a perforate casing, with a slidable grate beneath the same and means for operating the grate. In the casing is a rotatable shaft having oppositely disposed sets of inclined wings arranged at right angles to each other, and delivering to fan casings located at the ends of the perforate casing. Fans are located in the fan casings, and spouts at the rear ends of said fan casings deliver the material against a beater, which throws the straw down upon the straw carrier.

Lewis H. Livingston, Enid, Okla., mentioned above, has also secured a patent on improvements along the same line. Among other features, the fan casings of his construction comprise annular walls having discharge outlets located in the casing, and the fans constitute the outer wall thereof, and are spaced from the annular walls forming therewith grain outlets. Co-operating beaters are also employed in this last construction, and serve to thoroughly agitate the straw to secure thorough separation of the grain therefrom.

James B. Foote, Walton, N. Y. Clothes Pin.—This patent obviates the necessity of removing wooden clothes pins from the line after use,

and the clothes pin, which is adapted to remain permanently on a line, is capable of sliding thereon to engage and release a garment or other fabric. The clothes pin, which is effectually prevented from falling from a line and becoming soiled, enables clothes to be hung on a line and removed therefrom with greater ease and rapidity than heretofore. It has an enlarged or thickened upper portion, and is split at its lower portion to provide two sides and an intervening slot or entrance. The enlarged or thickened upper portion is provided with a clothes line receiving groove or opening, and a constricted entrance of less diameter than the clothes line connects the groove with the entrance slot.

Alonzo Baker, Granbury, Texas. Nut Lock.—The structure devised and patented by Mr. Baker is designed to effectively hold nuts against retrograde or loosening movements, and while particularly applicable to wood-work, such as bridge timbers and the like, is clearly capable of employment with other materials, especially in railroad work. In the preferred form of construction, a base is employed having a bolt-receiving opening there-through, the base being provided on its rear side with suitable anchors that embed in the material to be held, and having on the opposite side an annular series of radially disposed teeth that surround the opening. A circular rib is also formed around the opening. The nut is provided with a casing that covers the teeth, and has a rib that abuts against the rib of the base. Within the casing are mounted spring dogs that ride over the teeth when the nut is screwed inwardly upon the bolt, and interlocks with the teeth to prevent retrograde movement thereof.

Wm. L. Cooper, Speigners Station, Ala. Combination Tool.—The present tool is particularly intended for handling and opening cotton bales, and the device is a simple structure whereby the bands may be readily unbuckled. The tool comprises a shank having a transversely disposed handle at one end, and a buckle engaging head located at the other end. The head tapers towards its free terminal and has the rear side of its larger end terminating in an upstanding hook. The head is furthermore provided in its rear side, contiguous to its free end, with a buckle-receiving seat. The hook is used in the ordinary manner for handling the bales, and when it is desired to unbuckle the bale, all that is necessary is to introduce the head into the buckle and turn the buckle upon its edge, whereupon the ends of the band can be freely slipped therefrom.

Edwin Long, Cedar Rapids, Iowa. Bevel.—This invention relates more particularly to that type of cutting devices covered by Letters Patent, No. 765,391, granted to Mr. Long on July 19, 1904.—The object of this invention is to provide a simple device which will bevel the edges of card-board and the like, and in the present instance, the improvement aims to prevent buckling of thin and flexible card-board. The cutter comprises a stock having a longitudinally disposed guideway in one edge, one of the walls of the guideway being provided with a transverse slot. A rotatable cutter is mounted on the stock and has its edge extending into the guideway. The cutter is covered by a suitable guard or shield. A spring is located in the guideway, and is held in position by one end which is formed into a hook and engaged in a slot formed in the stock. Suitable handles project from the rear edge of the stock. To trim a card, it is only necessary to pass the edge through the guideway, whereupon the cutter will operate on the same and all buckling will be prevented.



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FOR SALE—Patent Hammock Support. No. 811,166, dated January 30, 1906. Both ornamental and useful. For particulars address, G. J. Nuessen, Andale, Kansas. jun

FOR SALE—U. S. Patents Hay Rake No. 842,234 and Hay Stacker No. 842,225, issued Jan. 29, 1907. Particulars address J. H. Neeb, Unionville, Mo. jun

FOR SALE—Patent No. 841,810. Sash Raising and Locking Device. It combines simplicity with efficiency at small cost. County or state rights sold. Apply to P. J. O'Brien, Mobile, Newfoundland. jun

FOR SALE—U. S. Patent No. 843,410, dated Feb. 5, 1907. Gate Hanger. Will sell by county or state rights. For particulars address, Charles A. Miller, Lock Box 208, Mendon, Ohio. jun

FOR SALE—Patent No. 841,995, dated January 22, 1907. Hen's Nest and Hatching Coop. Rat-proof, portable, meets with every requirement. Money maker for manufacturer. Make me an offer. H. I. Mier, 181 Springfield Ave., Rutherford, N. J. jun

FOR SALE—Fastening Device for Track Rails. Absolutely prevents the rail from spreading. Weight of train tightens the spikes as the tie gives beneath the rail. Invention was patented January 1, 1907. Will save time, labor and money. Address, Warren Scott, Collins, Ill. jun

FOR SALE—Patent No. 835,585, dated Nov. 13, 1906. Bailing Device for Transplanting Trees. Nothing of its kind ever invented. Easy to handle. A money maker for the manufacturer. Make me an offer. Address, H. Urmann, Box 197, Hicksville, N. Y. jun

FOR SALE—Patent No. 847,998, dated March 26, 1907. The latest and best self-locking nut. Adapted for bridges and railway work. Simple in construction and inexpensive. Endorsed by master mechanics of railroads. Address, Alonzo Baker, Granbury, Texas. jun

FOR SALE—U. S. Patent No. 839,996. Drinking Fountain for Live Stock, dated Jan. 1, 1907. Only successful fountain ever invented. Made of galvanized iron, any size. A money maker. H. M. Smith, R. No. 2, Monrovia, Ind. jun

FOR SALE—Patent No. 824,867. Combined Marking Peg and Center Punch. A handy tool for iron workers, enabling holes to be accurately centered in transferring from templates. Price very reasonable. Address, Wm. Houghton, No. 86 Green Street, Bath, Maine. jun

FOR SALE—Patent No. 842,679, dated January 29, 1907. Emergency Car Brake. Gradually but positively stops street car on grades when motorman has lost control. Simple, effective and practical. Sure life saver. Write Wm. Martin, 553 Trenton Ave., Wilkesburg, Pa. jun

FOR SALE—U. S. Patent No. 840,003, dated Jan. 1, 1907. Feeding Trough for Live Stock. Properly used as a self-feeder. Endorsed by some of the best breeders and farmers in the United States. A money-maker. Have not the finances to push it. All inquiries answered promptly. Address, H. W. Lineweaver, South English, Ia. jun

FOR SALE—U. S. Letters Patent No. 838,076, for Envelope and Stamp Moistener. Latest out. Always ready. For full particulars address, W. A. Brown, Brookhaven, Miss. my

FOR SALE—Patent for sale outright or for part royalty and part cash. Hatchet and Plane Combined. Patented in United States October, 1905. No. 800,646; in Canada March, 1906. No. 98,137. Address, D. M. Hancy, Box 44 Sykesville, Pennsylvania. my

FOR SALE—Patent of Oct. 2, 1906. No. 832,495. Reservoir Gate. For head of canal in river also. Size of stream never changes by water level rising or falling. Never clogs. Simple, cheap, and durable. For further particulars address, George A. Millett, Cedar City, Utah. apr

FOR SALE—Patent No. 838,965, dated December 18, 1906. Window-glass Fastener. Without the use of putty. Its easy to put on and its easy to take off, and the same taken off can be put back. For particulars address, James A. Douglas, Yates Landing, Ill. apr

FOR SALE—Patent No. 834,972, dated Oct. 30, 1906. Try-square. Enables the marking of two faces of the work simultaneously. Also permits marking of timber for square or plumb cut and for beveled cut. Blade of square can be used as a protractor. Every carpenter should have one. Will sell patent outright for United States and Canada. For particulars address, James Collie, Lake Linden, Michigan. apr

FOR SALE—U. S. Patent. Sure Catch Gate and Door Latch. Closing gate locks latch; no springs to break or rust out. No sagging. Hog-proof. Highly recommended by all who have them in use. A ready seller. Unlimited demand. Inexpensive to manufacture. A snap for right party. Address with stamp, J. B. Aikin, Wilmington, Ohio. apr

FOR SALE—Patent No. 767,714, dated August 16, 1904. Hot Air Furnace. Has many points of superiority. Is simple, durable, and practical. Address, Frederick Warner, Gnadenhutten, Ohio. apr

FOR SALE—U. S. Patent No. 836,214. Tree Cultivator. Price two thousand dollars cash. For particulars address, George B. Reeve, La Mirada, California. apr

FOR SALE—U. S. Patent No. 837,725, Skirt and Waist Fastener, issued December 4, 1906. Open to reasonable cash offers for state rights. S. P. Quigley, Ovid Center, N. Y. apr

FOR SALE—Patent No. 841,041, dated Jan. 8, 1907. Shaft and tongue support for buggies. Keeps them elevated when not in use; cheap and simple; quick and easy to apply. Applies to all buggies. Hitch up in half the time. No more stepping on shafts. Address, W. Noles, Patenter, Montrose, Iowa. my

FOR SALE—U. S. Patent No. 835,713, dated Nov. 13, 1906. Nail Box. Every time a nail is taken out it is ready for hammer. Handy tbing when nailing laths or shingles. It is very simple. Can be made for 20 cents. Make me an offer. Address, John Schuster, R. D. No. 4, Algoma, Wis. my

FOR SALE—Patent No. 842,411, dated Jan. 29, 1907. Compound Wooden Structure. Adapted for use in making straight edges employed by paperhangers and others. Will not warp or crack. Simple and perfect. For particulars address, Oliver Messinger, Box No. 544, Sheridan, Wyoming. my

FOR SALE—The only thing of its kind. A carriage top spring of great merit for sale. Prevents broken and bent bows. Rests reclining "top" where bow is strongest. Simple, durable and exceedingly cheap. Patented Dec. 11, 1906. Write me for illustrations. A. G. Paine, Cripple Creek, Colo. my

FOR SALE—Patent No. 807,402, dated Dec. 12, 1905. Combined Key and Lighting Device. Address, J. L. Scanlan, Indianapolis, Ind. my

FOR SALE—Patent No. 762,352, dated June 4, 1904. Excavating Machine. For particulars address, J. L. Scanlan, Indianapolis, Ind. my

FOR SALE—U. S. Patent No. 835,521, dated Nov. 13, 1906. A Combination Self-Setting Rat and Mouse Trap. Address, Henry F. Harfst, Meta, Mo. my

FOR SALE—Whole or part interest in my patent door and window fastener. Send twenty-five cents for sample and particulars. Address, H. E. Homes, Burlington, Vt. my

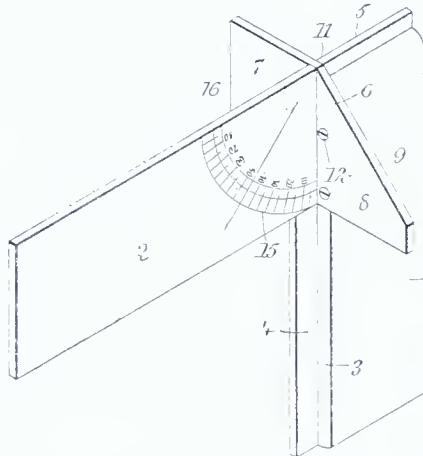
FOR SALE—U. S. Patent No. 837,285. Trap Hens Nest to trap hens, for keeping record of number of eggs laid during the year. For sale at a bargain. Address, Chowder & Wheeler, Bethany, Ill. my

FOR SALE or on royalty, or part royalty and part cash—Canadian Patent No. 103,071. A wrench that can run a nut on or off where little space for the handle to work machine wrench. Address, William A. Allen, Lecanto, Fla. my

FOR SALE on royalty—Patent No. 837,795, dated Dec. 4, 1906. Windmill for running both a pump and light farm machinery by using wire or hemp rope belt passing down center of mill around and over grooved pulleys. It will run smoothly. For particulars address, B. E. Cassell, Wyoming, Ill. my

FOR SALE TRY SQUARE.

U. S. Patent No. 834,872, issued Oct. 30, 1906. Canadian Patent No. 703,377, issued Jan. 29, '07.



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WASHINGTON, D. C. APRIL, 1907.

Safe Railway Travel.

It looks as though the general public sentiment in favor of some system of train control, so as to prevent accidents and better protect travelers by rail, were about to become crystalized into law. A measure, indeed, was pending in the last Congress, appropriating \$50,000 to test automatic devices for this purpose, and would probably have passed if the session had not been so short. After every railway horror there is always an outcry for automatic train stopping contrivances, the introduction of the block signal system, and some method of government supervision of the sort that has been found to work so well in England and Germany, in reducing the number of accidents. There is now a law in effect which compels the use of automatic couplers, and since it has been in operation the number of casualties among railway employes has been greatly lessened. The men who were obliged to couple cars used to be the chief sufferers, and most of the individual fatalities were due to this hazardous occupation. But now relatively few are killed in this way, although not all the railroads have yet adopted the system, the law having permitted a term of years in which these devices were to be installed. If correspondingly good results follow the use of the block signal system, our newspapers would no longer be filled with records of disaster.

The block signal system is already employed by fifty railroads of the country, covering 48,000 miles of road, of which trackage nearly 7,000 miles are the automatic block. This last is looked upon as the best development of the system. Thirty important roads, however, are without the system at all; but the increasing frequency and expense of collisions, and the influence of public opinion, are gradually bringing them into line. Most of the railroads which have installed the

system declare that it is one of the best investments they have ever made; and although officials of the non-progressive lines complain that they cannot afford to use it, the records show that it saves money in obviating the cost of collisions and accompanying law suits.

As for automatic train stopping devices, some short state lines have already tried them, and they seem to have met with success: but a thorough test of various methods should be made, and the best chosen and made compulsory for railroads everywhere. The German government with Teuton thoroughness, has taken a step in this direction that is worthy of imitation. It has bought a tract of land outside of Berlin and put in a mile or so of track, where all sorts of experiments are to be carried on with block signals, automatic signals, interlocking switches, and improved railway motor cars, both electric and gasoline. A number of devices for automatically stopping trains have been described from time to time in the INVENTIVE AGE, and in another column of this addition will be found an account of other ingenious inventions, which may some day find employment on our railroads.

Wealth in Ideas.

In spite of the multiplicity of inventions, there are a countless number of little things that are badly wanted by the busy world, and there was never a time when the value of an idea was greater than it is now. There is a constant demand for something new, something to save labor, (even in trifles) something to improve the conditions of life, and standing rewards are offered for originality. Among the inventions needed are the noiseless typewriter and the talking machine that will not grate; and the man who can devise an automatic oyster shucker will have a fortune at his command. The inventor of a method for treating straw hats so as to prevent them from changing color would soon be ranked among our millionaires. For years the human brain has been racked to devise a bottle that cannot be filled again, when once emptied, and a box that can be used only once. Over five hundred patents have been issued upon non-reusable boxes, and two thousand, perhaps, on non-refillable bottles. Yet certain owners of proprietary articles have a standing offer of a large bonus to the person who produces a practicable bottle of the kind described, as none of those so far offered have been found to satisfy them. Many of the new devices, they say, show much ingenuity, but none has met every requirement. Half a hundred patents have been issued upon devices for rapidly and effectively sealing tin cans—something for which there is a demand not only in the canning establishments, but in almost every household in the land. The perfect device remains yet unproduced, and the inventor will reap wealth from it.

Then there is the really efficient safety curtain for theatres; this has never yet been supplied; and the elec-

trical apparatus which will indicate clearly and precisely the degree of danger to which workmen are exposed when working in electrical industries with high tension conductors. Various associations for the prevention of accidents to workmen have offered rewards for the best invention in this line. An inexpensive process of rendering fabrics non inflammable without injuring the goods, would make its inventor rich. The man who solves the problem of cleaning a ship's bottom without docking, so as to prevent the growth in tropical waters, of two feet of weeds on the boards, would soon be able to tour the world in a yacht of his own.

The flying machine and the submarine boat open fields of vast possibilities, but they are too vast and too ambitious for the average inventor; and there are better prospects of financial returns in the little things that everybody uses. The simpler the idea, the more it seems to be worth. The wooden shoe peg, for instance, is the embodiment of simplicity, yet it brought millions to a Massachusetts man. The idea of attaching a bit of rubber to the end of a lead pencil had a market value of one hundred thousand dollars. The inventor of the balance wheel of the watch received an equal sum from the British government; but that was a century and a half ago, when money was worth more than it is now. A young machinist of Indiana made \$500 in ten minutes, in demonstrating an idea that had stirred in his brain for a long time. He was talking to a manufacturer about a hay sling that he was devising. As he described it, he took a piece of iron and in a few minutes had a model which illustrated the invention. He received five hundred dollars for it on the spot. A few years ago, a bright young woman who was working as a photographer's clerk, noticed that customers were fatigued and bored by the necessity of posing. She evolved the idea of saving them the trouble. The face alone is photographed, one limb is measured, and from this basis a splendid, gracefully posed portrait of the entire body is produced, without worrying the sitter to assume various attitudes. Today the girl owns a photograph gallery, and is making a large fortune.

Equally profitable returns await the genius who can provide gasoline for automobiles that will leave no trace of smell behind; ink that will not evaporate; a safety window cleaning appliance; a pen that will not corrode; a typewriter key that will not clog; a device by which camera exposures may be more accurately and automatically timed; better self-lubricating devices for certain machinery; a perfect smoke consumer; a durable and neat substitute for leather; a process by which the blades of scissors will sharpen themselves, just as a patent paper cutter keeps its edge sharp through its work; and a score of other things. The world's annual bill for coal is enormous; if anyone could supply a substitute for this fuel, he would be richer than if he were the head of a trust or the discoverer of King Solomon's mines.

Automatic Train Control.

The Interstate Commerce Commission, in its last annual report to Congress, asked for an appropriation to enable it to test safety devices for railroads. The great number of collision accidents of late—one can hardly open a newspaper without seeing the headlines announcing another wreck—has compelled the attention of the government to the need of protecting the travelling public. The last accident bulletin issued showed that there had been in the preceding quarter of a year 3,672 railway accidents of all sorts, of which over one half were collisions. Nearly twelve hundred persons were killed, and the appalling number of eighteen thousand injured. In view of the probability of the compulsory adoption of some system of train control, it is of interest to note what devices may come before the Interstate Commerce Commission for trial.

One of the most interesting of these has already been experimented with on a stretch of railroad near Washington, and the railroad officials who witnessed the test said that it was entirely successful. It is called the Born electric signal and brake. Briefly, it consists of two lights in the engine cab, one red to indicate trains approaching head on, and the other white to show a train approaching from the rear. The light being in the cab of the engine and in front of the engineer's eyes, it is impossible for him either to disregard it or miss seeing it on account of fog or smoke, which have been the causes of some of the worst disasters to railways.

The principle on which the system works is that the power of an electric current is proportional to the length of wire that it has to traverse. The tracks in this case are used for one wire and there is an inexpensive trolley wire running beside the track for the return current. In the cab of each locomotive is an electric motor to operate the safety device and the current furnished by the small dynamo is just half strong enough to work the motor. When two trains are approaching each other, however, they get double the power out of the dynamo, and at whatever distance the machine is set it begins to operate. If it is set for a mile, the lamps in the engine cabs commence to glow when the trains have just a mile of track and wire between them. If it is set for 100 yards, the system does not start to work till that limit is reached.

But the essential part of the system is that the safety of the train does not depend on the engineer heeding the warning of the danger lamps. There is a magnetic connection between the safety device and the throttle and air brakes, so that the engineer may be drunk, dead or asleep, and when he fails to cut off the steam and put on the brakes, the machine does that itself.

The cost of installing the system is said not to be great, being about \$300 a mile for the track connections, and \$50 each for the dynamo and motor in the engine cab.

One point of convenience that is claimed for the system is that it can be used independently of its safety

feature for telephoning or telegraphing from a moving train, and this is a matter of importance to the railroad officials in being able to keep constantly in touch with their trains, and to the public in being able to send messages from any point along the line.

It is claimed that the use of the system will enable any railroad to increase the density of its traffic 30 per cent with entire safety, and to crowded eastern roads this is a matter of no small importance.

Another device which has been presented to the commission for examination and trial is an automatic tripping device. It is worked by the pilot of the engine, and operates so as to cut off the steam and apply the brakes only if the signal is set at danger and is disregarded by the engineer. An ingenious apparatus for setting the brakes sprinkles oil on the rails in addition, the theory being that on the greased rails the wheels will revolve without moving forward. Another cab signal system differs from most others in making use of alternating currents instead of the direct current. There is a host of other devices, and it is hoped that Congress will appropriate money to enable their efficiency to be tested.

The block signal system, one of the best methods of train control, is already in use on a number of railroads; and although some serious accidents have occurred on these lines, it has always transpired that it was the operators who were to blame. The solution of the problem seems to lie in the absolute elimination of the human element, or in the adoption of the automatic block system.

The block system is any arrangement by which a space interval is preserved between moving trains, and a block is any given length of train into which the road is arbitrarily divided. In the ordinary method, operators are stationed at the end of each block to communicate, by means of telegraph or otherwise, advice as to train movements. In the automatic system, the signals, which consist of light arms of wood and colored glass discs for night use, are operated by electricity or some such power, and are controlled by the passage of trains over the tracks by means of electric circuits. The signals at the beginning of each block are arranged to show the condition of the next two blocks in advance, and can be made to indicate "safety," "danger," "caution—go slowly," etc. All automatic signals are so arranged that they will give a "danger" indication if any of the circuits or connections become broken or deranged. The use of this method makes mistakes practically impossible, and though it is rather expensive (about \$700 a mile) statistics show that no more reliable means of guiding trains has been devised. On the New York subway, probably carrying the most congested traffic in the world, where during rush hours 122 trains pass every sixty minutes, the automatic signals work with such precision that there has been an average of only one failure to half a million movements. When used in connection

with the automatic stop (by which a lever pivoted on the road bed and connected with the block signal, acts to automatically apply the brakes in case an engineer tries to run past a danger signal) public safety is practically insured.

China Trade-Mark Regulations.

Information has been received to the effect that owners of trade marks can deposit the marks, of which they claim to be proprietors, in China. No regulations as to registration of marks are as yet in force in China, and we are not advised that the deposit of marks at the present time confers any legal status or right. It can, however, do no harm, and seeing that deposits are being noted by the authorities and can be made without fee, it is for owners of trade-marks to consider whether their interests in China are of sufficient moment to make it worth their while to make such deposits. It is believed that applications for the deposit of marks can be made to the commissioners of customs at Tientsin, Shanghai, and Canton. Marks when deposited are being numbered and filed, and are open to inspection.

Dentistry for Trees.

The latest in arboriculture is to fill cavities in the trunks with cement, in order to arrest the decay of the trees. It has long been known that limbs could be prevented from decaying by wrapping them in cloth. This helps to exclude the dampness. Carrying these experiments a step further, it was found that cement would preserve the trunks from rotting, just as a filling of a tooth prevents further decay.

The question arose in connection with some valuable oaks in a park in New Orleans, which were losing their growth and verdure by reason of big holes in their trunks. It was accordingly decided to fill the apertures with cement. Several cartloads of sand, mortar and brick were used in the operation, which has been attended with great success. Old oaks regained their vigor, new branches began to grow, and altogether they put on signs of renewed life.

Since then the art of arboreal dentistry has been perfected to such a degree that even a new bark can be given to a tree. It is proposed to cover the filling with a layer of cement the color of the oak's bark, which can be so worked as to resemble a natural covering. It is said that this will preserve the tree even better than will ordinary cement, while at the same time it will add to its beauty by hiding the mortar.

Shingles of Cement.

Cement is to be used instead of wood for covering houses. These cement shingles are a little heavier than slate and are strengthened by metal skeletons that terminate in loops by which the shingle is nailed on. While they cost a little more, these shingles are said to be cheaper than any other covering material, as moisture instead of setting up decay, only causes the cement to grow harder, so that the shingles are claimed to be practically indestructible.

Dangers of Dust.

The eminent English physician, Sir Lander Brunton, declares that dust is one of the most active influences in shortening life. He says that it ought to be the rule rather than the exception for men and women to live for a hundred years, but one of the drawbacks to this longevity is dust, as it is the first cause of colds and respiratory diseases. He cites the severe colds that often accompany a siege of house cleaning, and recommends sprinkling with carbolic acid before dust on furniture, books, etc., is disturbed.

A Balloon-Operated Railway.

Balloons are coming into use for various purposes, undreamed of a decade ago. Trips in captive balloons are popular abroad, and voyages in airships are no longer considered remarkable instances of courage. But it remained for the owner of an amusement resort in Germany to use a balloon as a locomotive for pulling cars up a mountain. The inventor of this curious hoisting device believes that it will supersede the ordinary cable roads up steep mountain sides, and while being perfectly safe, will afford tourists a thrill that will add greatly to the zest of the expedition.

To seat oneself in a small railway car and be towed with ease to the top of Pike's Peak, for instance, is quite different from the old method of toiling painfully and slowly up and down the sides of the mountain, and has advantages over the cog wheel railways that are now common for this purpose. The cost of installation is by no means so great, and the motion is lighter and pleasanter. The idea is merely an adaption of the captive balloon, so arranged that long but well controlled flights are possible. In fact, the big air bag simply journeys up and down the mountain side, as a prisoner to a long steel rail. This rail forms the track of the railway. It is fastened up the side of the mountain, and can span chasms without the necessity of bridging. Nor is it necessary to tunnel projecting points of rock, as the rail may be fastened to the outside. Its great advantage is that it may be strung up the side of a mountain which ordinary railroads could not climb. Fastened to this rail is a heavy steel slide, which is intended to hold the gas bag captive. From the slide to the balloon runs a large cable, which permits the balloon to soar about 35 feet above the rail, but holds it firmly in place there. Suspended from the balloon is a circular car capable of holding about a dozen passengers. A very small train crew is required, consisting of one man—the conductor. At the scheduled hour, this official pulls a lever and the balloon car is off. In ascending it is lifted, of course, by the hydrogen gas; no matter how strongly the wind may be blowing, the captive balloon cannot get away, but is held firmly by its steel cable. On descending, a tank under the car is filled with water, and the whole is dragged down by gravity. It is thought that this device, which is entirely practicable, will become popular with travelers who are constantly on the search for something new.

Methods of Creosote Analysis.

The growing scarcity of lumber, with the consequent high prices, is making it imperative that more attention be paid to preservative processes whereby the time of service of timber may be lengthened. Coal-tar creosote is generally regarded as the most efficient of the wood preservatives. This product is very variable in composition, owing to differences in the coals used and in the methods employed in their distillation. Creosotes of different compositions are believed to have different values as wood preservatives, and an analysis of the oil used is, therefore, important.

No very large amount of study has been directed to perfecting the methods of creosote analysis, and the Forest Service, believing the matter vitally important to the progress of wood preservation, is now carrying on an investigation of these methods.

The most important part of a creosote analysis is the fractional distillation, since by this operation an approximate determination is made of the relative proportions of the most important substances in tar oil. There has been considerable divergence of opinion as to the best way of carrying out the fractionation of tar oils, some recommending a retort as a distilling vessel and certain temperatures for taking fractions, others recommending a distilling flask and a different set of temperatures.

Laboratory experiments carried on by the Service have shown that the difference in the weights of the fractions obtained when using different sorts of distilling vessels are not large, but that the composition of the fractions indicate a little better separation by the flask than by the retort. As regards the influence of the rate of distillation, variations of from one to three drops per second have but slight influence on the weights of the fractions, though the slower rate is more satisfactory.

It is commonly believed that the relative amounts of light oil, naphthalene, and anthracene oil are the most important factors determining the value of a creosote for wood preservation. A number of creosotes were very carefully fractionated and determinations made of the amounts of naphthalene and solid anthracene oil distilling between various temperatures. The average of the results shows that at least twenty-five per cent of naphthalene was present in the distillate between 205° and 250° C., and that over twenty-five per cent of anthracene oil solids are present in the distillate above 300° C. Work on the specific gravity and the index of refraction of the distillates between different temperatures is now being carried on.

The desirability of getting the criticisms and suggestions of users of creosote has led to the publication of a detailed account of the methods employed in the experiments and the results which have been obtained. Those who desire the publication should ask for Circular 80, Fractional Distillation of Coal Tar Creosote. Request should be made to the Forester, Forest Service, Washington, D. C.

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Concrete floor construction.....F. A. Koetitz
Concrete. Mold for embedding tablets in.....T. J. Missildine
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Conductor pipe machine.....S. M. Schmeltzer
Confection baking apparatus.....E. H. Lanier et al
Connecting pin.....J. R. Reniff
Controller.....W. Cooper et al
Conveyer apron.....E. Schaffner
Copper. Hardening.....R. T. Anderson
Copying machine.....D. T. Marshall
Cork puller.....H. Bitner
Corn cutter.....A. C. Robey
Corn sorter.....2 pats.....L. P. Graham
Corset.....E. Savoye
Cotton and corn chopper.....D. O. Graham
Cotton mercerizing machine.....L. Cipollina
Coupling.....J. R. Lilley
Crane. Traveling.....C. L. Taylor
Crib or bed. Sliding side folding.....C. Vailone
Crusher and pulverizer.....W. H. Gardner
Cryptograph.....H. Burg
Cultivator.....E. M. Heyman
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Curtain bracket.....W. Jones
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Curtain hoisting apparatus.....T. Eskilsson
Curtain support.....W. Hubert
Cut out.....E. M. Hewlett et al
Cut out. Electrothermal.....F. B. Cook
Cutting and grinding machine.....F. H. Brown
Dam. Automatic.....F. Camagni
Die stock holding and operating device.....W. V. Bu'man
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Disinfecting device.....J. E. Lee
Display form.....G. Galland
Display mechanism. Colored light.....N. C. Nielsen
Display rack.....W. B. Loewenberg
Disruptive or explosive effects. Obtaining.....W. O. Wood et al
Distilling.....J. F. Wittemann
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Door check and holder.....J. R. Gallinger
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Doors. Roller support for edgewise movable.....G. Georgenson et al
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Draft equalizer.....C. H. Matlock
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Dredging apparatus.....H. B. Buddenborg
Drill.....C. Partington
Drill bit. Fluid feed side inlet.....J. H. West
Drill can.....N. S. Hillyard
Driving and reversing mechanism.....W. & G. F. Meischke-Smith
Dust separating blower.....W. J. Baldwin
Easel.....A. H. Connelly
Egg and cake beater. Combined.....J. S. Dunlap
Egg beaters. Holding bracket for.....G. F. Bailey
Electric circuit controller.....H. W. Leonard
Electric conductor.....S. G. Brown
Electric conductors. Swivel tip for.....W. F. Barker
Electric resistance apparatus.....R. von Brockdorff
Electric waves. Means for receiving intelligence communicated by.....G. W. Pickard
Electrode and producing same. Carbon.....T. P. Sharts
Elevator door controlling apparatus.....S. Bentley
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Engine controlling means. Gas.....E. Evans
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Envelop making machine.....G. W. Dietz
Exhibing hats, bonnets, and the like. Device for.....F. W. Nunn
Explosive. Waterproof metallic.....T. A. Bayliss et al
Eye guard or shield.....H. S. Cover
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Feed water purifier.....C. Timmerman
Fence making machine. Wire J. E. Fredrick
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Fence post and stay.....M. M. Wickham
Fence. Wire.....J. Fisher
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Fibers. Preparing.....T. G. Saxton
File or holder for sales slips, &c.....J. F. Huber
Finger print registering device.....M. P. Evans
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Fire escape.....P. M. Legere
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Firearm sight.....C. G. Thunen
Flooding. Wood block for.....W. C. Morrill
Flower band mold.....A. M. Lockard
Fluid pressor. Electrically driven.....A. H. Gibson
Fluid pressure regulator.....L. B. Fulton

Fluid pressure brake.....2 pats.....W. P. A. Macfarlane
Food product.....A. Morel-Lautier
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Fruit bin.....H. C. Bowman
Fruit evaporator.....M. S. Reatz
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Garment supporter.....F. Hirsch
Garment supporter or garter.....H. M. Stidham
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Gas generator. Acetylene.....T. Lenzi
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Gas or gasoline saver and heat controller. Combination adjustable.....W. F. Nichol et al
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 Bolts, pins, &c. Machine for making J. F. Lober
 Book cover or protector G. A. Flohr et al
 Book. Triplicate manifold sales E. K. Bottle
 Boot cleaning and polishing outfit A. J. Brooks
 Boot machinery W. Heaton
 Bottle J. C. Anderson
 Bottle capping machine G. Kirkegaard
 Bottle carrier C. B. Hall
 Bottle filling machine M. Hamburger
 Bottle filling machine. Cased. T. L. Valerius
 Bottle. Non refillable C. Medley
 Bottle. Nursing H. D. Singer
 Bottle protector. Milk J. Grossman
 Bottle washer G. K. Watson
 Bowling pin F. M. Wood et al
 Box fastener G. A. Prather
 Box lid holder J. C. Feldman
 Box making machine F. R. Harris
 Box opener J. Marshall
 Bracket A. A. Ficenser
 Brewing apparatus C. B. Davis
 Brick machine H. L. Hix
 Brick machine H. Armstrong
 Brickmaking machine E. R. Sutcliffe
 Bridge and bridge guard or railing S. Richardson
 Brooder N. C. Sprague
 Brush T. Brantley
 Brush H. Delle
 Brush making machine W. G. Liebig
 Brush. Scrubbing J. Rich
 Bucket making machine J. A. Watt
 Building foundation P. Seiler
 Burial robe W. J. Worden
 Button machine. Wire F. Margraff
- Button and drawers supporter. Combined trousers J. T. Lane
 Cabinet. Merchandise L. Mathews, Jr
 Cabine table. Kitchen Z. Krappo
 Calculating machine W. R. Borham
 Calendar R. C. & P. Sellers
 Caliper gage. Combination B. J. Reehm
 Camera C. I. Flory
 Can jackets or other receptacles. Hard for sheet metal G. W. Weber
 Cans. Forming covers for sheet metal J. Brenzinger
 Canopy standards. Guiding and supporting mechanism for P. F. Swart
 Car construction E. I. Dodds
 Car coupling S. Morris
 Car door J. Montgomery
 Car door fastener R. Mobley
 Car draft and buffing gear I. O. Wright
 Car. Dumping F. Peterer
 Car. Motor H. O. Carter
 Car operating mechanism. Dumping H. F. Ball
 Car platform. Vestibule C. W. Bremken
 Car replacer W. A. Hntson
 Car side bearing W. W. Woolf
 Car stake. Gondola W. O. Moody
 Car standard G. W. Du Bes
 Car standards. Self clearing chain stay for G. W. Du Bes
 Car. Tank 2 pats. T. R. Brown
 Car underframe structure. Transverse E. I. Dodds
 Car ventilator J. H. Elward
 Cars. Carline for railway C. A. Lindstrom
 Cars, &c. Guard or gate for street G. A. Metcalf
 Carriage top attachment W. C. Willits
 Cash register P. Meyer
 Casket holder P. Wallrath
 Catch H. R. Baker
 Centrifugal machine. Single shaft W. L. D'Olier
 Chain making machine H. Lysholm
 Chaining device H. B. Arden
 Chair head rest D. Sarason
 Chamber, stop jar and the like C. W. Meinecke et al
 Check. draft and similar instrument M. Berardini
 Chimney cowl F. S. Egly
 Chuck. Drill L. T. Ganss
 Churn H. Garbutt
 Cleaning and separating machine A. T. Hedfeldt
 Clock. Watchman's O. E. Hausburg
 Clutch W. R. May
 Clutch M. H. Avery
 Clutch. Centrifugal J. Fellows
 Clutch. Friction W. F. Rothe
 Coal screening and grading apparatus J. Rapp
 Coal washer J. Rapp
 Cock. Safety J. C. Stratiff
 Coffee and tea flask J. Garrigan
 Coffee pot H. M. Murray
 Coffee urn W. F. Stabinger
 Comb C. Schmidt
 Combustion. Promoting P. J. McNamara
 Commutator brush for dynamo-electric machines R. N. Baylis
 Compasses. Oval C. Schreiber
 Composition of matter E. Volier et al
 Concrete construction. Reinforced W. Curlett
 Concrete dam. Reinforced H. L. Coburn
 Concrete foundation piers. Constructing G. W. Jackson
 Concrete metal construction E. Flad
 Concrete mixer feeding device R. Wilcox
 Concrete structural work. Metallic reinforcement in C. Horix
 Condenser C. Ambrose et al
 Condenser. Steam C. Ambrose et al
 Conveyor J. F. Doeble
 Cooking vessel M. J. Corbell
 Cooling board head rest. Adjustable A. A. Corbell
 Core forming and holding device. Sand B. F. Hobert
 Cork and making the same. Artificial J. Serra y Carbo
 Corn husking machine feeding mechanism J. W. Paige
 Corn picker J. H. Leidel
 Corn picker and husker C. Pearson
 Corn shoe loader and unloader F. Johnsen
 Corner bead J. M. Coleman
 Cotton cleaner and gin feeder M. E. & J. L. Norris
 Cotton from its impurities. Machine for cleaning and separating J. S. Lyle
 Cotton. Plant for storing baled D. Breck
 Cotton separator W. A. Patterson
 Coupling device V. D. Gaa
 Coupling pin and compound tool. Combined J. Patterson
 Crank hanger F. M. Osborne
 Crossing. Movable point W. M. Henderson
 Cultivator W. M. Stamps
 Curling iron G. F. Shields
 Current generators. Voltage regulator for alternating F. R. Keller
 Current machine with commutators and with compensating windings. Alternating R. Richter
 Curtain and shade fixture. Combination M. O. Dolson et al
 Curtain fixture I. L. Hotelling
 Curtain fixture C. L. Hopkins
 Cuspidor D. S. Green
 Cutting and polishing machine H. E. Hall
 Cycle W. C. Kidney
 Cycle. Motor W. C. Johnson
 Darning implement G. Shear
 Dashes. Metallic strip for J. H. Matthews
 Dental bracket A. W. McKenney
 Dental vulcanizers. Gas regulator for E. E. Wightman
 Direct acting engine. Compensating W. C. Brown
 Dish drainer J. P. Tibbits
 Disintegrating apparatus. Soft middlings J. M. Case
 Display can or box. Sheet metal F. Rudolph et al
 Display case H. C. Eigly
 Display outfit S. Newman
 Display rack L. A. Alson
 Display rack F. Rudy

- Display rack..... F. P. Sparmaker et al
Display stand..... J. F. Kiedy
Distilling apparatus..... Water
Door and window screen..... R. S. & H. C. Lazenby
Door fastener, sliding..... A. M. Gifford
Door fastener, sliding..... C. S. Morse
Door fastener, sliding..... J. A. McPhayden
Door gage..... J. T. Root
Door hanger..... 2 pats..... G. Wideman
Door, shelf..... F. C. Lacke
Door, sliding..... A. L. Lewis
Door structure, revolving..... B. H. Uarich
Drainage..... E. A. Barry
Dredges and the like, upper tumbler for..... S. L. G. Knox
Drier..... S. L. G. Knox
Dry kiln..... L. Moore
Drills, work holding attachment for..... G. E. Metcalf
Ditching fountain, poultry..... C. R. Upson
Driving mechanism..... A. Wundelich
Drum and cymbal beater, bass..... H. A. Bower
Electric circuit, means for maintaining constant the voltage of an..... T. Marshall
Electric machine, dynamo..... E. Oeschner
Electric motor..... D. Mendelson
Electric switch mechanism..... F. C. Newell
Electric transmission receiving device..... I. Kitsee
Electrical connections, clamp for ground wire..... W. K. Cox
Electrical indicating device..... C. Crandall
Electrical purposes, socket bushing or fitting for..... W. B. Stewart
Electrical resistance..... A. O. Bencke
Electrical switch..... E. W. Brackett
Electrical switch..... R. H. Maasson
Electrical winding..... J. W. Lattig et al
Electrically driven step by step machine..... A. F. Poole
Elevator safety mechanism..... 2 pats..... H. Bawden et al
Emery grinding machine..... A. Macnack
Engine starting mechanism, gas C. G. Herbert
Engines, equalizing device for direct acting..... O. H. Mueller
Envelop, seal..... W. H. Reed
Eraser..... G. W. Park
Explosion motor, rotary..... C. A. Littlefield
Explosive engine..... C. H. Brooks
Eye cleansing device..... W. Reeves
Eyeglass nose guard..... L. E. Ault
Fabric and rubber material..... C. C. Beebe
Fabric, means for storing and dispensing sheet..... J. E. Hart
Fare register..... O. N. Moore
Fastening device..... J. W. Bosche
Feed box..... R. S. Smith
Feed box, metallic..... H. M. Thayer
Feeder, poultry..... Z. Nevers
Fence post..... P. J. Harran
Fertilizer distributor..... S. K. Dennis et al
Filter bed cleaning machine..... H. W. Blaisdell
Filter cleaning machine, covered..... H. W. Blaisdell
Fire escape..... K. Leon et al
Fire signal system, automatic..... K. L. McElroy et al
Firearm safety device..... A. Beckwith
Fishing reel..... A. F. Meisselbach
Flag holder..... N. S. Maizepeace
Fleshing and slating machine..... J. Dunn
Floor construction, steel..... J. A. Emerson
Fluid pressure brake mechanisms, coupling apparatus for..... G. E. Kelly et al
Folding table, convertible..... C. I. Ridgely
Fork and rake, convertible..... C. C. Tyler
Frequency and voltmeter..... J. F. Begoe
Frequency indicator..... A. S. Langsdorf
Fruit brushing machine, 3 pats..... F. Strain
Fuel, artificial..... D. Drawbaugh et al
Furnace..... H. Strand
Fuse, electric..... L. W. Downes
Game..... F. M. Osgood
Game apparatus..... A. A. Lehr
Game apparatus..... G. H. Jurick
Game apparatus..... R. T. Lambert
Game board, base ball..... C. H. Wolff
Game device..... H. D. Darlington
Garbage receptacle..... C. C. Mittendorf
Garment fitting stand..... G. H. Scully
Garment hanger..... C. H. Gage
Garment supporter..... H. E. Gifford
Gas apparatus, producer..... H. F. Smith
Gas burners, combined cock and support for cluster..... J. W. McKnight
Gas generator..... C. D. Finley
Gas generator controlling device..... F. Durr
Gas manufacturing apparatus..... J. J. Busenbenz
Gas producers, handling ash in..... H. F. Smith
Gas retort charging and drawing machine..... J. West
Gas retort charging apparatus..... W. Slingsby
Gas seal and regulator, combined..... C. W. Bradley
Gas trap, safety..... F. J. Wood
Gearing..... G. E. Bouvier et al
Gearing..... W. Crawford
Glass feeding and delivering apparatus..... J. Schies
Glass, machine for making window or plate..... W. W. Keyes
Glass, method and apparatus for drawing..... R. L. Frink
Gold from silver and other metals, separating..... D. Clark
Grade meter..... T. M. K. Overland
Grader..... J. Bagley
Grader, road..... A. W. McBlain
Grain renovator..... L. J. Johnson
Grain shocking device..... J. C. Waggoner
Grate..... J. Demarest
Grate, duplex dumping and shaking..... P. L. Shaw
Grease cup, automatic..... T. L. Derr
Grease extractor..... T. J. Kieley et al
Grinding and polishing apparatus..... F. L. O. Wadsworth
Grinding centers, attachment for..... C. L. Petrikin
Gun sight..... H. J. & T. T. Wise
Gun sight..... D. W. King, Jr
Gun sight..... J. Y. Bassell et al
Hair straightener..... C. C. Call
Handles to sheet metal vessels, means for applying..... G. W. Weber
Harrow cart, detachable..... J. W. Harmon
Harrow, disk..... C. S. Sharp
Harvester, corn..... E. A. Johnston
Harvester, corn..... J. Hettrich
Hawse pipe..... C. Petrie
Hay and grain rack..... A. Weaver
Heading machine..... E. C. Meyer
Headlight, locomotive..... T. D. Comer
Heating apparatus, steam..... W. P. Hussey
Heel piece..... B. Nathan et al
Hinge..... G. L. Noe et al
Hinge, flush..... J. Erickson
Hoist, fluid actuated regulated cushioned..... G. F. Steedman
Hoisting and conveying apparatus..... T. S. Miller et al
Hoof pad..... C. Bellmann
Hoppie..... L. B. Engelhart
Horse detacher..... H. G. Simpson
Horseshoe..... C. Bellmann
Hot air furnace..... P. E. Odell
Hot air register..... F. H. Dudley
Hot water heater..... E. F. White
Hubs, sand cap for wheel..... H. C. Clay
Ice cutting machine..... E. F. Evans
Igniter, electric..... J. D. Wilmot
Incubator..... N. C. Sprague
Incubator..... G. E. Littlefield
Inkwell..... D. A. Valentine
Inkstand..... J. A. Irving
Internal combustion engine..... 2 pats..... H. G. Underwood
Intestine cleaner..... W. F. Duncker
Iron castings into steel or malleable iron, converting..... M. A. Hunter
Ironing board..... E. W. Harris et al
Ironing device..... M. Sunshine
Ironing or bosom board..... W. Thurbur
Jar wrench, fruit..... J. L. De Steiger
Journal bearing railway..... G. H. Clamer et al
Journal box lid..... A. Lipschutz
Journal box, locomotive..... G. J. Hatz
Jug top..... J. F. Haffey
Kettle for boiling water..... H. Appley et al
Key ring snap, safety..... A. C. Bludner
Keyless lock..... J. W. Davenport
Knife..... L. E. Jenkins
Knitted fabric..... R. W. Scott
Knitted fabric, ribbed, 2 pats..... R. W. Scott
Knitting machine, open work..... 2 pats..... R. W. Scott
Knob and bell, combination door..... J. P. Foerster
Label spreader..... G. N. Byler et al
Ladder, step..... E. W. Miller
Ladder, store service..... L. Wilour
Lamp..... C. C. Malton
Lamp globe..... G. A. Macbeth et al
Lamp, miner's safety..... E. Piepenbring
Lampsocket..... C. A. Chase
Lantern..... C. S. Leland et al
Lantern lighting device..... C. S. Leland et al
Lantern, signal..... A. H. Handlan, Jr
Last..... J. H. Waite
Lathe for working pipes or bars, automatic..... A. H. Blackburn
Lead product..... J. W. Bailey
Lead slug, rule, and furniture case..... W. M. Oungst
Lighting device, automatic time..... W. M. Ginn
Line holder..... J. M. Clausen
Linotype machine, 3 pats..... J. R. Rogers
Liquid distributor..... A. A. Keller
Lock..... T. S. Morton
Lock..... J. G. Horsey
Lock and latch mechanism..... H. G. Voight
Locomotive supply system..... A. P. Dodge
Loom, filling replenishing..... J. Northrop
Loom for weaving chenille or pile fabrics..... T. F. Naylor et al
Loom lug strap holder..... E. H. Major
Loom, weft replenishing..... H. W. Smith
Looms, figure weaving attachment for dobby..... J. A. Guss
Looms, guard for take up mechanisms for..... L. Labeau
Loss preventing device..... A. Payton
Lubricator..... C. G. Glasrud
Mail and parcel delivery apparatus, apparatus, automatic..... Z. P. Dederick
Mail bag catcher..... W. J. Bock
Mail marking machine..... H. E. Waite
Mail transportation system..... O. O. Johnson
Massage apparatus..... J. C. Johansen
Match box..... H. M. Kabele
Measure, computing..... M. E. Cummings
Measuring and cutting machine, cloth..... P. S. Swan et al
Measuring instrument, electrical..... 2 pats..... A. O. Bencke
Mechanical connection..... L. T. Kline
Metallic screen, extensible..... A. A. Day
Mills, feeding device for ball..... M. F. Abbe
Mining drill..... J. N. Rickles
Mirrors and other like articles, making toilet..... H. M. Schwartz
Mold..... W. B. Bussard
Molding machine..... H. Bannan
Mortar mixer..... L. D. Gentzler
Motor..... S. J. Evans
Motor..... H. S. Mills
Motor controller..... T. S. Watson
Mowing machine..... S. V. Kennedy et al
Music leaf turner..... G. Regondi
Music rack, folding..... J. H. Rockwell
Music sheet..... J. B. Walker et al
Nail and rivet machine..... J. Buckley
Nail holding attachment for driving tools..... B. F. Schmidt
Neckband holder..... C. W. Richert
Newspaper assembling machine..... W. E. Wines
Nut lock..... T. E. Cnud
Nut lock..... A. F. Thompson
Odometer..... J. D. Roberts
Ore in cars, device for disintegrating..... J. A. Lawler
Ores, treating..... W. Kemp
Outlet box, electric conductor..... R. S. Parsona
Oven, baking..... J. D. Nasmith
Packing, shaft..... F. T. Nolan
Packing, shaft..... C. L. Cook
Pail, milk..... G. Thomas
Paint remover and making the same..... P. T. Austen et al
Painting, sign..... T. Munnecke
Paper board, means for drying or curing..... T. W. McFarland
Paper folding machine..... M. Mehle
Paper holder and cutter, roll..... J. F. Finan
Paper sheets, machine for forming flexible bands across..... R. L. Crain
Paper sheets to increase their flexibility, treating..... K. L. Crain
Paste table and tool box, folding..... S. W. Bradt
Pencils, assortment box or display rack for lead..... F. McIntyre
Phonograph record duplicating apparatus..... V. M. Harris
Photographic prints, device for washing..... A. S. Johnson, Jr
Photoplate holder..... J. R. Garlick
Pianissimo device..... W. C. Vogel et al
Piano, automatic..... M. Clark
Piano, violin..... F. H. Watson
Pianos, rewinding mechanism for self-playing..... H. Meyer
Piccolo or other musical instrument..... H. Bernard
Picture mounting page or sheet..... C. F. Engstrom
Pipe and conduit hanger..... J. C. Lindner, Jr
Pipes and other cylindrical objects, means for gripping and lifting..... A. J. Edwards
Pipes, drive head for well..... S. S. Hitchcock
Pipes, valved outlet for waste and overflow..... D. W. York
Planter, corn..... T. A. McKee
Plotting instrument..... E. L. Campbell
Plow..... L. M. Whisenant
Plow, riding..... W. L. Casaday
Pneumatic wheel..... W. L. Barnard
Pole tip..... L. J. Lucey
Pot or pan lifter..... E. L. Fisk
Press..... G. W. Swift, Jr
Pressure system, multiple..... C. von Philip
Printing press..... J. E. Lee
Printing press..... W. H. Smiley
Printing press cylinder..... G. W. Mascord
Printing press inking arrangement..... G. P. Fenner
Propulsion of submarine vessels..... S. Lake
Protectors, treating..... M. R. Isaacs
Prying implement..... J. C. O'Brien
Pulley, friction..... H. Hess
Pump..... F. Burns
Pump..... J. P. Montgomery
Pump..... H. M. Stetter
Pump and condenser, centripetal centrifugal..... R. S. Prindle
Pump, vacuum..... L. R. Alberger
Pump, well..... A. L. Medlock
Punch..... J. F. Hardy
Puzzle..... A. D. Bennett
Puzzle..... C. M. Nealy
Rail bond..... G. A. Mead
Rail brace..... J. Berlien
Railway..... 3 pats..... S. E. Jackman
Railway brake mechanism, inclined..... S. E. Jackman
Railway bumping post..... W. E. Symons
Rail way crossing..... E. T. Umms
Railway crossing..... J. E. Reese
Railway gate operating mechanism..... M. H. Loudon
Railway tie, sectional cement..... L. Blessing
Railway tracks, safety third rail for..... J. McRaven
Ram, hydraulic..... J. D. & W. H. Weaver
Razor, safety, 3 pats..... W. C. Heimerdinger
Receiver..... L. W. Austin
Reclining chair..... W. W. Edwards
Reclining chair..... O. H. Watkins
Registering letters and the like, color freed apparatus for..... A. Fodor et al
Reservoir..... M. A. Martin
Reservoir bleeder..... J. E. Mounie
Road construction..... C. P. Walter
Rock drill making and sharpening apparatus..... G. Glossop
Rock drill, means for circulating a cooling medium in gas actuated..... O. C. Duryea
Rock drilling machines or engines, drill or bit rotating mechanism for H. Hellman et al roof gutter..... J. O'Dowd
Rotary engine..... W. A. C. Pape
Rotary engine..... S. H. Draper
Ruler..... M. D. Bryson
Salt and pepper cellar..... P. W. Smith
Sand blast apparatus..... E. A. Arcouet
Sandpaper holder..... M. V. B. Stone
Sash fastener..... E. Sloan
Sash lock and holder..... Z. Xeyers
Sash lock, window..... M. H. Gaba
Satchel latch..... J. H. Wiedner
Saw attachment, hand..... W. C. Sennett
Saw filing machine..... J. M. Beaver
Saws, insertible tooth for metal..... S. Freas
Scabbling machine..... J. M. & M. H. Owens
Screens, fly escapement for window and door..... J. A. Gee
Screw driver attachment..... F. D. Rappelee
Screw, jack..... W. Ferris et al
Screwthreading dies, mechanism for finishing..... E. E. Beck
Seal, spring lock..... J. C. Davis
Seaming machine, can body side..... H. C. H. Walsh
Selling and delivering apparatus, automatic..... L. O. T. Thompson
Separator..... O. Selg
Sewing machine plaiter or ruffler..... J. T. Reley
Sewing machine trimming device..... W. H. Stedman
Shade cloth with identification mark thereon..... C. W. Breneman
Shade roller..... J. Evans
Shade supporting means, adjustable window..... J. F. Cannon
Shaft bearings and the like, indicator for overheated..... F. W. Dick
Shaft collar..... C. E. Brinley
Shaft, extensible..... V. A. Yost
Shears..... J. G. Mouscus
Sheet feeding device..... E. Tyden
Sheet metal can for lard and other articles, slip cover..... B. H. Kannenberg
Sheet metal slitting machine..... L. E. Curtis
Shelf supporting bracket..... J. J. Worley et al
Shirt..... L. Bernstein
Shoe cleaner..... S. Feld
Shoe upper fastener..... C. K. Sharood
Signal control, electric..... M. Abt
Smoke cleaner and cinder catcher as applied to locomotives..... J. Roesser
Snap fastener..... T. R. Hyde, Jr
Soldering compound..... R. A. Hall
Soldering machine, can end F. Rudolph et al
Sounder and resonator, combined..... S. F. Cox
Speed transmission mechanism, variable..... J. H. Boughton
Speed varying mechanism..... G. T. Rennerfelt
Speedometer..... A. Fleischmann
Spinning machine spindle bearing..... A. Stell
Spinning mule..... J. Schmitt
Splitting machine..... E. A. Hildreth
Spring seat..... A. Bodenstern
Spring wheel..... E. B. Sims
Sprinkler..... C. C. & H. G. Rhodes
Sprinkler heads, emergency shut off for..... E. Abbott
Sprinkling system, combined water and chemical..... S. C. Radford
Square..... W. A. Schmalz
Square, carpenter's..... G. Yates
Stable implement..... G. S. Prescott
Stacker hood..... A. Luke
Stain and filler..... T. J. Kelly
Stair rod holder..... I. N. Giffin
Stalk cutter..... E. A. Franz
Stalk puller..... C. R. Smith
Stamping machine..... 2 pats..... C. W. Gray
Staple puller and fence maker's tool..... H. Cottrell
Steam generator..... J. A. Mumford et al
Steam meter..... W. A. Kitts
Steam separator..... G. Clark
Steam trap..... W. Gelpel
Steel tempering bath..... J. Churchward
Steering and propelling mechanism, boat..... W. H. Fahrney
Steering gear..... F. Y. Harrison
Step hanger..... A. N. Manross
Stitch impressions or indentations, burnishing machine for imitation..... L. W. G. Flynn
Stone blocks, machine for making artificial..... V. W. Grumman
Stopper..... B. F. Welden
Store front construction..... F. J. Plym
Stove or oven door support..... R. A. Culter
Street or station indicator..... C. A. Myers
Striking bag apparatus..... J. F. Emes
Stubble cutter and destroyer, cane..... J. Le Blanc
Submarine structure..... M. E. Pester
Sulfid ores, treating..... O. Fronck
Sunshade or umbrella support..... D. M. Keech
Surveying instrument, bore hole..... P. E. Lewis
Suspenders..... S. H. Loorye
Suspenders for wearing apparel..... A. Weintraud
Switch stand, 2 pats..... F. W. Snow
Switching mechanism..... C. A. Anderson
Talking machine sound box..... E. D. Gleason
Tapping mains, apparatus for..... W. H. Van Winkle
Telegraph pole, metal truss..... L. Blessing
Telegraphic receiving device..... I. Kitsee
Telegraphy..... I. Kitsee
Telephone exchange..... C. A. Anderson
Telephone exchanges, calling device, or..... F. A. Lundquist
Telephone exchanges, registering device for..... F. A. Lundquist
Telephone signaling device..... K. Weman
Telephone system..... C. G. & E. J. Burke
Telephone system..... I. Kitsee
Telephone systems, pole distribution rack for..... W. Robinson
Telephony, multiplex..... J. W. Lattig et al
Tenpin..... J. M. Teeter
Tentering machine..... H. L. Quick
Thermostat..... H. E. Reeve
Threshing machine band cutter..... M. C. Albertson
Tie plate..... E. H. Bell
Tilting gate..... E. C. Compher
Tobacco pipe..... G. Boston
Tool, percussive hand..... H. B. Stocks et al
Top spinning pistol..... S. B. Newman
Toy..... A. D. Bennett
Toy animal..... L. E. Coleman et al
Toy, dancing..... H. W. Thornton
Train signaling and indicating apparatus, combined 2 pats..... W. A. & B. S. H. Harris
Train ventilating system..... J. H. Elward
Transfer mechanism..... H. W. Blaisdell
Traveling carrier..... D. M. Motherwell
Tray, instrument..... W. G. Hullibard
Trolley harp..... C. & W. Hibbard
Trolley retriever, automatic..... R. J. Walker
Trolley switch..... B. G. Watkins
Trolley wheel and harp..... E. S. Roland
Trolley wheels, wire retrieving attachment for..... W. C. Althen
Troughs, making..... C. D. Pruden
Truck..... J. H. Morris
Truck..... E. Peckham
Truck car..... A. E. Ostrander
Truck for harvesters, tongue..... G. L. Phelps
Trunk or the like fastener..... E. W. Hawley
Turbine muffler..... C. R. Cray
Turbine, steam..... R. Schulz
Turbines, fastening of blades in..... R. Schulz
Turning tool and calipers, combined..... R. S. Whipple et al
Typewriter..... J. B. Hammond
Typewriter cabinet..... C. B. Perry
Typewriters, polychrome ribbon attachment for..... J. Ruffin
Typewriters, sight attachment for..... J. B. Hammond
Umbrella rod..... L. Berger
Underwear..... C. R. De Bevoise
Valve..... H. C. Cronmeyer
Valve, automatic relief and back pressure..... J. V. Schmid
Valve, boiler check..... L. Kassandra
Valve, check..... R. H. Kiddle
Valve, flushing tank..... W. H. Ludwig
Valve for flush tanks, supply..... R. McGraw
Valve for radiators, air relief..... D. D. Casey
Valve for sprinkler systems..... J. McAlear
Valve, gas engine regulating..... F. G. Hobart
Valve, puppet..... R. Wishon
Valve, steam..... F. M. Metcalf
Valves, regulator for use with filling..... A. Schneider
Vehicle body, interchangeable..... W. N. Beecher
Vehicle brake..... D. T. Lohnes
Vehicle check attachment..... S. L. Duckett
Vehicle step, extension..... G. F. Shaw
Vehicles, detachable running board for motor..... H. E. C. Giffin
Vehicles, &c., gear case for motor..... O. Pfander
Vehicles, method of and apparatus for braking..... G. H. Condict
Vehicles, sleigh runner attachment for wheeled..... A. G. Wyeth
Vehicles, speed changing and brake gear for motor driven road..... A. H. Adams
Vending machine..... A. Smith

Vending apparatus. Coin controlled liquid... F. W. Waterman
Ventilator... W. F. Warden
Vessel. Non-refillable... L. Barnes
Vessels. Making collapsible and expandable... W. M. Fulton
Violin bridge... W. H. May
Voting machine... W. H. Dana
Voting machines. Multi-indorsement restricting device for... W. M. Delavan
Vulcanizing apparatus... H. H. Frost
Wagon... J. H. Montgomery
Wagon and sled. Combined... J. P. Muller
Wagon hound... A. H. Freitag
Washing machine... L. D. Thornburgh
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Badge... J. A. Montgomery
Dish or similar article. Covered... C. J. Ahrenfeldt
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Boiler draft regulator. Steam... A. J. Snow
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Billet... J. H. Barow
Buoy, torpedo, and similar device... W. E. Hill
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Button machine... H. J. Skipp
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Car door. Flush... R. Mobley
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Car fender... N. P. Duncan
Car fender... J. H. Dixon
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Car fender. Street... C. B. Mead
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Car wheel... T. L. Hawkins
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Closet bows. Waste pipe connection for... H. J. Luff
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Clothes clamp... T. W. De Langhter
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Cluster socket... J. H. Dale
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Coal dust for making metallurgical coke or other kinds of coke. Utilizing close burning... G. de Velna
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Cotton cleaner and distributor... J. Clem, Jr
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Cracker box... J. H. Byrne
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Cultivator. Adjustable... W. Wolf
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Current motor. Alternating... E. J. Berg
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Die head... W. A. Kerr
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Metallic silicids. Producing..... T. L. Willson
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Nail clipper..... O. Kampe
Necktie frame..... W. C. Truman
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Nickel ores, &c. Treating..... R. W. E. MacIvor
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Oil can. Airtight..... J. Dahl
Oil can. Non-explosive..... F. W. Reiber
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Packing. Metallic piston..... W. Hoey
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Paper hanger's support..... J. L. Bonar
Paper receptacle..... F. H. Berold, Jr
Peat drier..... B. F. Lambert
Peeling machine. Fruit and vegetable..... W. Vogel
Pen. Fountain..... F. C. Brown
Pencil holder..... F. M. Ashley
Photographic plate developing machine..... W. H. Brown
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Planter and fertilizer distributor..... B. W. Burdett et al
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Pneumatic cleaner..... W. W. Conover
Pneumatic despatching tube system..... C. H. Burton

Pneumatic despatch carrier..... C. H. Burton
Pocket knife..... S. Sanderson
Pole tip. Vehicle..... E. W. Boswell
Polishing compound..... E. W. McFarren
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Portable elevator..... F. H. & F. H. Brown
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Powder distributor..... W. J. Barber
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Pump operating mechanism..... J. H. Kane
Pump packing..... C. W. Swan
Pump. Rotary vacuum..... D. M. Moore
Pumping jack..... J. M. Branam
Pumping motor..... O. E. Lindfors
Punching machine. Work feeding..... J. A. Eden, Jr
Pyrometer..... J. F. Hammond
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 Lathe turning attachment.....A. E. Thayer
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 Leather. Producing a dull finish on coated.....L. Feval
 Ledger. Loose leaf.....R. B. Wilson
 Legging.....F. J. Stewart
 Lifting jack.....L. O. Hara
 Light transmitting and light diffusing object.....E. Bohm
 Light transmitting objects. Producing.....E. Bohm

Lightning arrester.....C. A. Rolfe
 Lock.....H. France
 Locomotive water heater.....D. W. Cunningham
 Loom protector mechanism.....J. V. Conniff
 Loom shuttle motion.....O. Lamwers
 Loom t k up mechanism.....C. F. Roper
 Looms. Means for hanging knitted leased harness for.....F. A. Mills
 Lubricating apparatus. Ball joint.....W. W. Nugent
 Lubricating cup.....E. Hill
 Lubricating device.....C. S. Bavler
 Lubricator.....J. W. Hinchcliff
 Lubricator.....T. E. Brooks
 Machine driving mechanism.....R. P. King
 Machine driving mechanism.....H. Ogborn
 Machine parts. Machine for treating cylindrical.....J. Moli
 Mail bag catcher and deliverer. Reversible.....J. L. Gash
 Mail bag catching and delivering apparatus.....E. A. Nasland
 Mail bag exchanger.....D. Mack
 Manifold pad or book.....S. C. Nussly
 Marking apparatus.....E. M. Schantz
 Marking machine.....J. D. Caldwell
 Measuring implement.....F. J. Osius
 Measuring apparatus for electricity.....E. Mier y Minra
 Measuring instrument. Electrical.....T. W. Varley
 Measuring tool. Angle.....M. Barbo
 Mechanical movement.....R. B. Ware
 Metal blooms, &c. Apparatus for transferring reissue.....E. E. Slick
 Metal. Coating.....H. H. Baumgard
 Metatarsophalangeal protector.....J. Bronnenkant
 Mica sheets. Making artificial.....E. Cooper
 Milk can.....C. P. Harmison
 Mine cages, lifts, hoisting skips, &c. Safety clutch for.....W. M. Hodgson
 Mirror. Window.....S. S. Freitz, Jr. et al
 Miter box.....P. Dosch
 Mixing machine.....H. G. Morris
 Mold.....P. T. Burkholder
 Molding machine.....N. Baldwin
 Molding. Ornamental pressed metal.....A. E. Ostrander
 Motion. Means for converting.....G. W. Ilett
 Mowers and similar articles. Handle for lawn.....J. Fleming
 Music holder.....G. M. Snow
 Music leaf turner.....E. R. Edridge
 Music record sheets. Means for producing expression marks on.....B. S. Dean
 Musical apparatus. Mechanical.....G. P. Brand
 Musical instrument.....J. W. Bailey
 Musical instrument brake. Self playing.....J. Hattermer

Continued in May Number.

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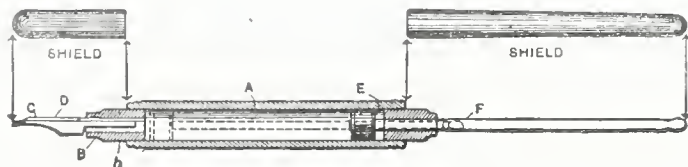
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NINETEENTH YEAR. }
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WASHINGTON, D. C.—MAY, 1907.

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STUDYING THE ILLUMINATION OF THE HEAVENS.

By FRANK C. PERKINS.

PROBABLY few illuminating engineers have made a study of the lighting of the heavens, leaving this interesting work to students in astronomy in our great universities and modern observatories. There are without doubt many lessons to be drawn by the illuminating engineer however, by studying nature's great electric lights and nature's illumination of this earth of ours, by day as well as by night.

Many eminent scientists believe that electricity is the great universal force, and that electricity is the source of our light through the sun by day and the stars and moon by night. The late Dr. Henry Raymond Rogers maintained that sun heat and sunlight as well as starlight are electrical phenomena, that the electrical currents in passing from the sun to earth in meeting the earth's atmosphere awakened light and heat in this medium by its resistance, the same as the carbon filament of the incandescent lamps glows on account of its resistance to the passage of the electric current. He maintained that the sun could supply light and heat to the earth as a cold body by electric power, as reasonably as to consider it radiating heat and light through 93,000,000 of miles through intense cold. He held that as you go up a mountain it gets colder and the sun light gets dimmer, tending to show, he explained, that the sun was really cold and the

heat and light was produced in our own atmosphere. The study of the heavens is most interesting and great work is being done by eminent scientists in American and foreign colleges with the latest improved instruments in studying the stars, moon and planets.

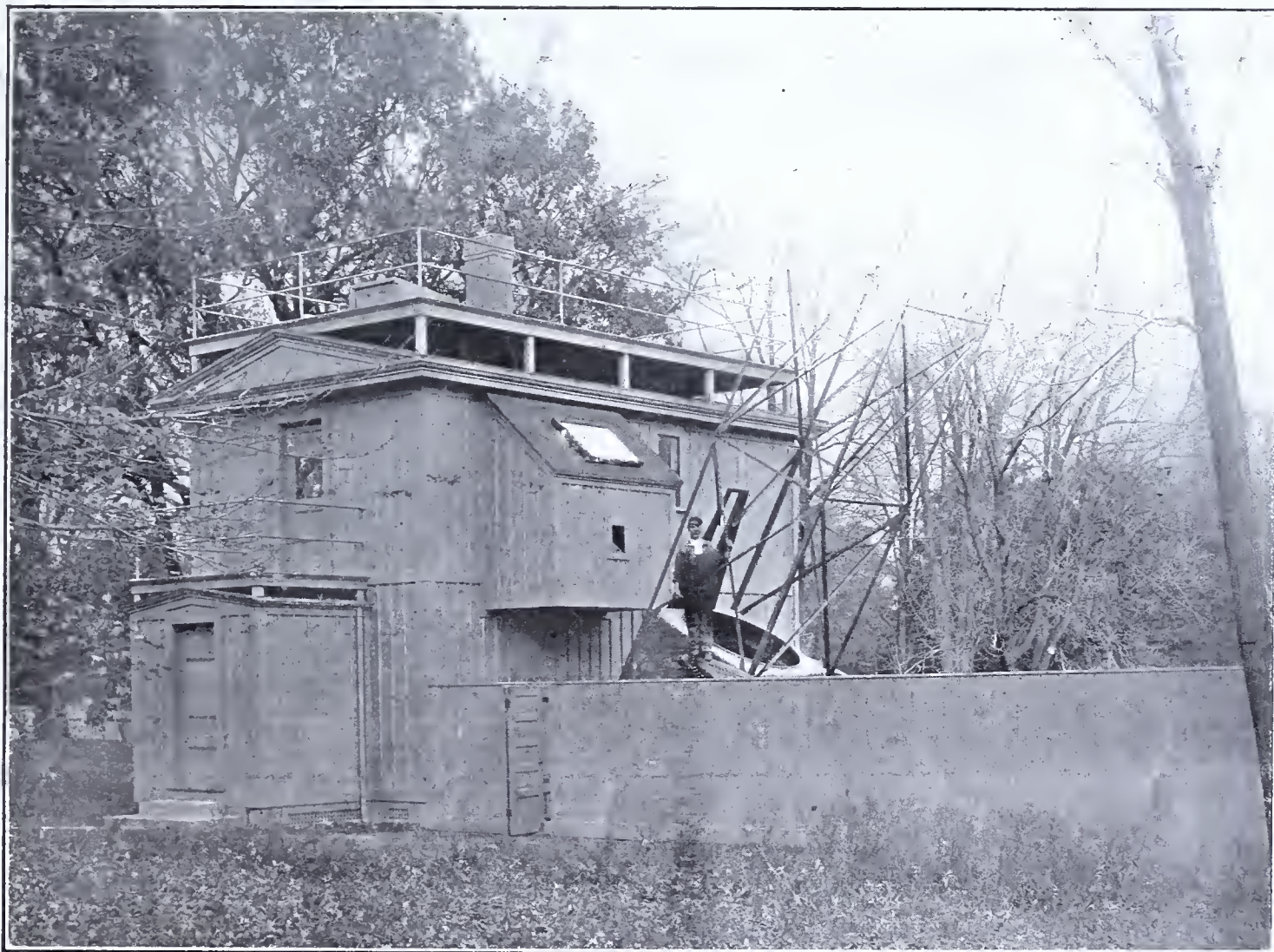
The accompanying illustration and

Pickering has been engaged in the determination of the light of the stars for a number of years at this observatory, about 100,000 measurements having been taken of 4,000 stars, including all of those which are visible to the naked eye in Cambridge, and all of those of the sixth magnitude and brighter, north declination—30°. This

it is maintained that more than a million settings have been made with it on nearly 60,000 stars in all parts of the sky, from the south pole to the north, and numerous standards of the tenth magnitude and brighter, were provided by means of this instrument.

About 15 years ago a telescope of 1 foot aperture was used in a similar manner, and mounted horizontally, and since that time nearly half a million measures have been made of about 11,000 stars, thus furnishing standards of those stars of the twelfth magnitude, and brighter.

An appropriation was recently made by the Rumford Committee, and with the co-operation of the directors of the Halsted Observatory as well as McCormick, Yerkes and Lick Observatories, a determination of the standard magnitudes of very faint stars was undertaken with several of the largest telescopes in the world. Until recently a request had never been made for a telescope of the largest size for use at the Harvard College Observatory, for the reason that the atmospheric conditions in the Eastern



THE 60-INCH TELESCOPE AT THE HARVARD COLLEGE OBSERVATORY.

drawing shows the details of construction and arrangement of the 60-inch telescope at the Harvard College Observatory, the diagram showing the float with its polar axis, the location of the observing room in the upper part of the building, and the silvering room below. Prof. Edward C.

important work was accomplished about two decades ago with a telescope having an aperture of only two inches. Two or three years later a similar instrument of 4 inches was constructed and used at the Harvard College Observatory, and also at Krequipa since that date, and

part of the United States and in Europe are not so favorable for the most accurate and best work as in the tropics in certain selected localities.

Prof. Edward C. Pickering states that by a modification of the 12 inch telescope above mentioned good measures can be made of the stars,

although their images are imperfect, and by reducing the image of the real star, instead of that of the artificial star, more accurate measures may be made and certain sources of constant error eliminated, defects in them being rendered imperceptible since both images are faint when compared. He maintains that in this manner even the planet Mars has been satisfactorily compared with an artificial star.

The reflecting telescope shown in the

received as an anonymous gift to the observatory, and Mr. T. A. Common practically contributed a large portion of the cost after the facts had been presented to Prof. Turner of Oxford University when he visited Harvard College, and finally steps were taken for transferring the instruments to Cambridge, the packing and transportation being a most delicate operation. This fine instrument having the great aperture of five feet has been

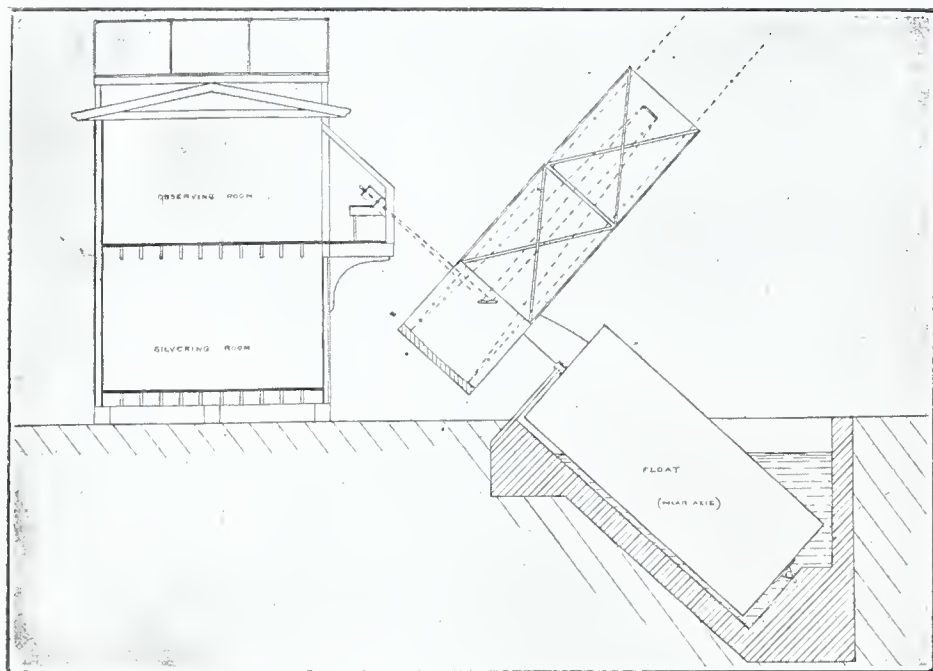


DIAGRAM SHOWING LOCATION OF OBSERVING AND SILVERING ROOMS.

accompanying illustration and diagram has an aperture of 60 inches, and was constructed by the late A. A. Common. This telescope is said to be especially adapted to measuring the light of extremely faint stars on account of its great aperture. For some time past the authorities of Harvard College were anxious to obtain this large reflecting telescope but the means of the observatory would not permit; but about three years ago \$20,000 was

of inestimable value in continuing the work of many years in measuring the light of the very faint stars, observations being taken to supply one of the great wants of astronomy. The accompanying illustration and drawing was supplied to the writer through the courtesy of Director Edward C. Pickering of the Harvard College Observatory at Cambridge, Mass., who also supplied the above data as to the work being carried out at this celebrated educational institution.

Water Shoes.

The article on "Walking on the Water" published in the INVENTIVE AGE for March has attracted considerable attention. Mr. P. J. O'Brien, of Mobile, Newfoundland, writes in regard to an apparatus which he devised some eleven years ago, which appears to be similar to the invention of the member of the life saving crew at Charlestown, Mass., described in the AGE as above. The technical details of the device are of interest to those who desire to indulge in this form of aquatic sport, and are given below.

The inventor designed two boats of the dory type, somewhat about 7 feet long, 6 inches wide in the bottom and 8 inches amidship on deck, having a long, straight overhanging stem and stern, and slightly curved longitudinally in the bottom. On the bottom were attached plates of zinc, about 4 x 6 inches. One edge was hinged to the bottom transversely to the keel. In the center on the fore side was soldered another triangular piece having a right angle at the apex or edge next the bottom. Where this piece or fin hung perpendicularly from the bottom, the upper edge of the forward piece rested against the keel and prevented the fin from going forward beyond the rectangular position. Several of these were attached to each

boat, six of them giving one square foot of driving surface. As in skating or walking with snowshoes, one foot is stationary while the other is being brought forward, so as one boat stopped, the fins dropped to a right angle with the line of motion, or the position of greatest resistance. The other in being brought forward pressed the fin flat against the bottom, offering little or no resistance, while the triangular part, acting like a fish's fin, sent the boat along her course and prevented drifting apart.

The boats, the inventor says, must be decked. In the center is a "well" to fit a man's boot, which gives the foot perfect control, while offering no impediment in case of an upset. It is recommended that the operator use a double-bladed oar, such as are employed in canoeing. This will aid in guiding the boats, act as a propeller when the legs get tired, and increase speed when used together with the fins.

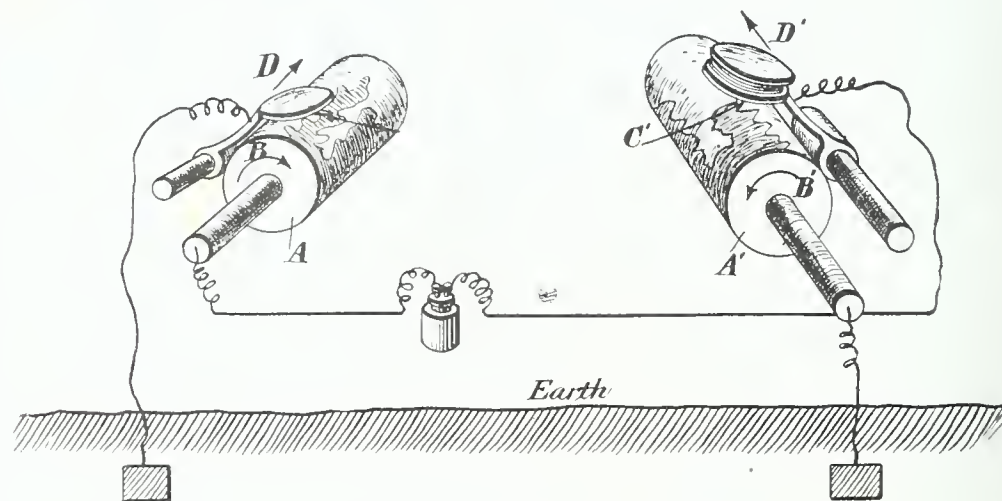
Another boat which Mr. O'Brien has devised is some 12 feet long, 8 inches wide and 5 inches deep, or with a buoyancy of about 200 pounds. It is meant to be propelled by a man standing astride, with his feet in stirrups, so to speak, on either side, the stirrups being supported by straps. The boatman may wear rubber boots. He uses a double-bladed oar for propelling the vessel.

Any handy man, the inventor adds, could make these boats at a small cost, and they should be an attractive feature of regattas and other aquatic sports.

THE TELAUTOGRAPH.

A description of the telautograph has already appeared in the columns of the INVENTIVE AGE, but the following account, taken from *Le Petit Bleu* of Brussels, gives further details of this remarkable invention, which means the transmission of photographs, etc., by telegraph. A native of Belgium, Mr. Carbonnelle, is responsible for this apparatus, which is founded on the double principle of the phonograph and the telephone, and is characterized by simplicity of construction and of methods of transmission and receiving.

In this device, the telephonic waves are replaced by telegraphic waves, properly speaking. The machine can thus be utilized on any ordinary telegraph line, and can serve to transmit telegrams as well as writing signatures, or any kind of picture. It can produce an impression on paper, or on a metallic base which can be used as a cut for reproducing the photo., etc., in newspapers, or for any purpose desired. The rapidity of transmission is remarkable. It can engrave a cut three inches square at the rate of 18 a minute; it also offers an extremely effective method of sending telegrams, as 500,000 letters can be transmitted on the same wire. Finally, it does not necessitate photographic development at the receiving station, which adds greatly to its convenience. The system is composed of two phonographic apparatuses, either of which can be used to send or receive messages.



As shown in the illustration, the cylinder A of the transmitter turns in the direction of the arrow B, under an elastic metallic stylus C which moves as shown by the arrow B, in the same manner as the diaphragm of a phonograph. The cylinder is connected electrically to one of the wires and the stylus C to the other wire of the telegraph system. The receiver is identical with the transmitter, except that the stylus C is replaced by an engraving point C', carried by the vibratory membrane of a telephone receiver.

The message, photograph, drawing, or other object which it is desired to transmit, can be received on any material, such as metal, lead, tin, wax, paper, etc. Suppose it is wished to send a copy of a sheet of tin on which has been printed, in non conductive ink, a photograph. The original is given the form of a roll, which is slipped on the cylinder A of the trans-

mitter. The stylus C is placed at the starting point (as in a phonograph,) a similar roll is placed on the cylinder of the receiver, the engraving point is placed in the proper position, and the two apparatuses are put in motion. As the cylinder A turns, the stylus touches all points of the original cut. As this is a metallic sheet covered in certain places with non-conductive ink, it results that when the stylus touches the metal, the electric current passes readily and naturally, while at the spots covered with ink, the intensity of the current varies during a period of time proportionate to the size of these spots, and these variations are reproduced in the receiver, the point C' penetrating into the metal each time that the current varies, and entering more or less deeply according to the importance of the variation. When the stylus is at the end of the cylinder, the point C' is likewise at the end of the receiving roll, which has been cut as an engraver would have done by hand, reproducing faithfully all the shades of the original. There has thus been obtained at the receiving station a metal cut which can be used immediately for printing.

The above system, as will be seen, does away with all complicated operations. No longer is it necessary to have dark rooms, or electric lights; one can dispense with uncertain and slow chemicals, as well as with negatives from which the photograph is afterwards taken. No special training is essential for the work: a child could transmit and receive the drawing. Not only is the telautograph of scientific interest, but of practical importance

Houses of Cinders.

The cinders left from burning rubbish and waste at the municipal destroying plants in England are used, in some places, for constructing houses. The cinders are first crushed and molded with cement into great wall slabs, each with its door and window openings molded in place, and even an interior iron framework for putting the whole together. The slabs, some of them weighing 11 tons, are handled by derricks. When set up the iron frames are bolted together, and the joinings closed with cement. It is said that an entire block of buildings made of this cement has been put up in Liverpool, and that it yields the city a good percent on the investment.

The Development of the Telephone.

One of the interesting exhibits at the Jamestown Exposition is a series of relics showing the development of the modern telephone. It is the most complete collection of the kind ever made, and includes many instruments of inestimable historical value. The most valuable is a bulky and homely instrument showing the essential features of the first electric telephone that ever transmitted speech. There are also shown Bell's "iron box magnetic receiving telephone," as it was called, which figured in the Philadelphia exposition thirty years ago, and which Sir William Thomson, after trying the novel apparatus, pronounced a perfect instrument. That he spoke wisely is proved by the fact that from that time to the present, the telephone has not been radically improved. It was the first phone having both armature and diaphragm of iron; the instrument first mentioned had a skin diaphragm. Among other precious relics of the telephone's infancy is what is known in the scientific world as Bell's "Figure 5," apparatus. This is so called because it was thus described in the original patent of March 7, 1876, and this instrument derives interest from the fact that its operation showed conclusively from the first that the extremely feeble electric currents flowing in the telegraph circuit would reproduce in the receiving instrument an exact duplication of the sound made by the transmitter. The exhibit will also show various types of transmitters which have been devised down to the latest improvement which was used when the record in long-distance telephoning was made, between Boston and Little Rock, Arkansas—nearly two thousand miles. Special transmitters, known as the "solid back" are employed for this long-distance speech. The development of the apparatus along the byways of commerce is shown, such as that used in mines and on snipboard: the receiver that is clasped to the head of the operator at the central office and the transmitter, curled like a shepherd's horn, which is always before her mouth, no matter to what point on the switchboard she may turn: the apparatus the busy line-man carries, and the different forms of telephone that serve the business man.

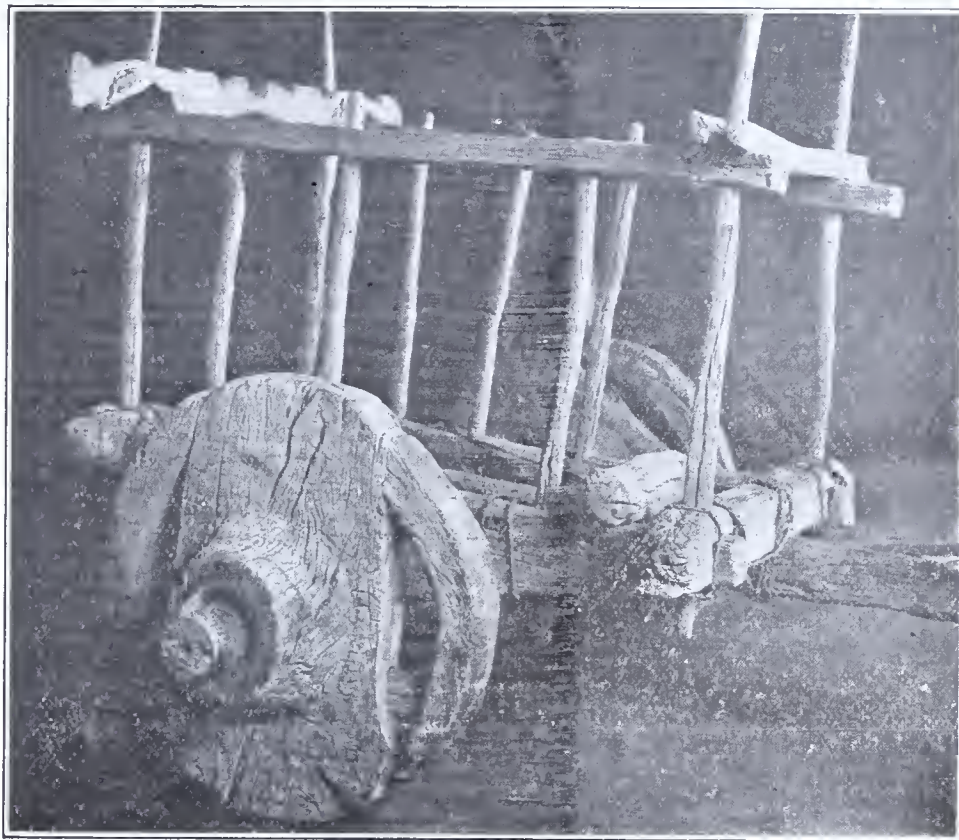
In this connection, it may be mentioned that the most ingenious use of telephones on record is in France, where a citizen of Troyes has constructed a house which almost solves the servant problem by the substitution of electric service. A telephone connects every part of the premises with the garden gate. As soon as a visitor rings, he hears the inquiry "Who is there?" When he has given his name, the master welcomes him through the telephone and the gate opens, to close when the visitor has entered. In the vestibule, before he is aware of it, magic brushes clean his shoes, and the door opens automatically, while a mysterious voice tells him where to find the owner of the house. When he is hungry, food appears on the table at the pressure of a button, and newspapers and letters are deposited on the drawing room table as soon as they are dropped. Most singular of all, the inventor of the magic house has practically reproduced the ear of Dionysius. Although he has not entirely dispensed with servants, he is constantly within earshot of the maid, the cook and the gardener, and the ubiquitous telephone transmits to him every word they say to each other.

AN ANCIENT INDIAN CART.

By CHARLES ALMA BYERS.

AN Indian cart, or carretta, over 200 years old, is one of the unique attractions on exhibition in the Chamber of Commerce at Los Angeles, California. This ancient cart is probably the oldest representative of the modern vehicle in existence, and, as will be seen by the accompanying illustration, it is still in a very perfect state of preservation. In fact, it has been only ten years since it proved its

that his great grandfather had made and used it when a young man, he being a native of Te-que, a small town about nine miles from Santa Fe, the capital city of New Mexico. Capt. Newton H. Chittenden, a noted traveler and explorer of the Southwest, purchased the relic from the trader and exhibited it in various cities of the United States. In 1896 he donated it to the Chamber of Com-



AN INDIAN CART OVER 200 YEARS OLD.

strength by making a trip of sixty miles on its own wheels.

Just how old the cart really is cannot be definitely stated, for its history is not easily traced. It was obtained, however, several years ago by a trader, from a Pueblo Indian, known as San Alfonso, at the village of Rio de Suca, New Mexico. San Alfonso, who, by the way, was a convert to the Catholic religion, was at that time about 85 years of age. He was still making use of the cart, and he said

merce at Los Angeles, California, in honor of the election of William McKinley to the presidency, and had it make the trip of sixty miles from his home at Redland to Los Angeles on its own wheels.

The cart is made entirely of wood—cottonwood, sycamore and mesquite—and is bound together with rawhide thongs. It was hitched to the horns of the oxen also with rawhide thongs—a means of hitching still in vogue among some of the Indians of Old Mexico.

Phonograph to Catch Burglars.

A novel device for protection against burglars has been invented and is said to be in use by business houses in some of our large cities. In the top story of the building is a phonograph placed before the receiver of a telephone. Electric connection exists between the phonograph and downstairs windows and doors, so that when a door or window is forced the phonograph calls up central and asks for the police station. When this is given the machine announces that a robbery is going on and gives street and number and keeps on repeating the information as long as the receiver is down. The burglars of course do not hear what is going on above, and if the police are alert, the lawbreakers can be trapped.

Tall Buildings, Properly Designed, Immune Against Earthquakes.

There is no reason to fear structural damage in tall buildings in San Francisco or anywhere else by an earthquake as severe as that of April 18, 1906, provided these buildings are properly designed and constructed. This is the opinion of Frank B. Gilbreth, the New York contractor, who is reconstructing the eight-story steel frame Mutual Life building in San Francisco. Mr. Gilbreth has been in San Francisco for several months, where he is taking a leading part in the work of reconstruction, and during that time, has had exceptional opportunities for studying the effects of seismic disturbances and conflagrations upon various types of structures.

The Mutual Life building, which is

taller than the average ten-story building, was built thirteen years ago on made ground, and survived the earthquake without a structural blemish. During the subsequent conflagration, however, it sustained damage sufficient to necessitate the removal of the upper six stories.

When it was known that Mr. Gilbreth had received the contract for reconstructing the building, he was at once besieged from all sides for information. Engineers and architects wanted to know about the condition of the steel frame. Paint manufacturers and dealers inquired as to the brand of protective paint which had been used to prevent rust, while representatives of other lines overwhelmed him with questions as to what had happened to other materials which had been used. The evidence collected by Mr. Gilbreth is of the utmost value to the building industry, and is one of the first cases where it has been found possible to make a thorough investigation as to the condition of structural steel and iron after having been embedded in a building for a term of years—a much mooted question among engineers, architects, and builders.

Mr. Gilbreth, due to his investigations, believes that:

1. A steel frame, properly painted and buried in masonry, will not rust enough in thirteen years to affect its strength any measurable amount.

2. The better the steel is coated with mortar, the less it will rust.

3. Portland cement is better than lime mortar for imbedding steel to prevent it from rusting.

4. Unpainted iron rods buried in mortar composed of lime and a large proportion of Portland cement rust very little: certainly not enough to impair their strength.

5. Columns should be of such cross section that they can be thoroughly imbedded in Portland cement, avoiding a hollow column unless latticed and filled with very soft concrete.

6. Wherever possible, preference should be given to those shapes of steel that present the least surface to the action of rust.

7. If steel is not thoroughly cleansed from rust before it is painted, the paint will not greatly retard the progress of the rust.

8. It is much easier to cover steel thoroughly with concrete than with brick masonry. If brick masonry is to be used, the bricklayer should thoroughly plaster the steel work ahead of the brick work.

9. The quality of the paint used, though important, is not so important as surrounding every part of the steel with Portland cement.

10. Interior columns do not rust as much as exterior columns.

11. Cinder concrete does not injure to the slightest degree a steel floor beam that has been painted.

12. No pipes or wires should ever be placed behind fireproofing, as they will buckle with the heat and push off the fireproofing.

13. This building probably could have been saved intact if it had had fireproof exterior door and window frames with wire-glass and an emergency water-tank on the roof.

14. Terra cotta blocks are not as good as concrete for fireproofing interior columns, nor do they protect the steel from rusting as well as does Portland cement concrete.

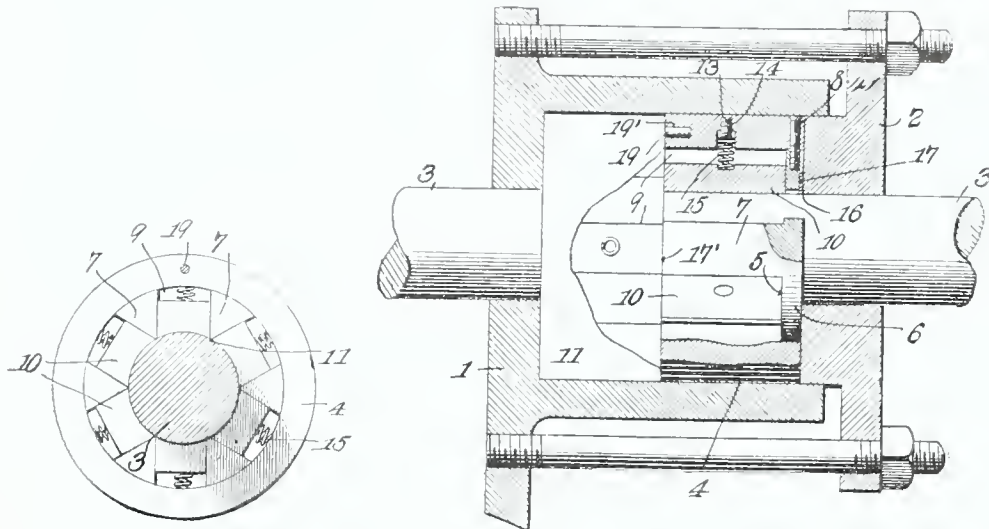
15. Neither marble nor any of the well-known kinds of plaster will withstand heat. There is a tremendous demand for some durable material that can be worked as easily as can wood or plaster, but which will resist great temperature.

CLEVER NEW PATENTS.

SHAFT AND ROD PACKING.—NEW AMUSEMENT DEVICE.—DRAFT REGULATOR.

Shaft and Rod Packing

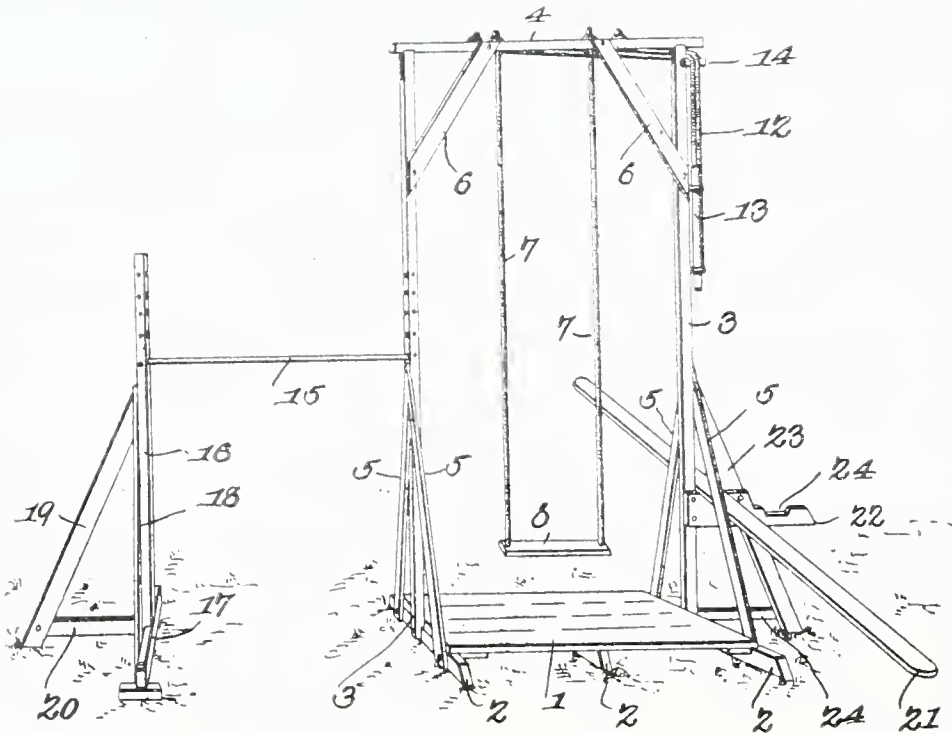
A metallic rod-packing for preventing leakage around a reciprocatory shaft or stem has been devised and patented by Mr. Eugene A. Bryant, of Minneapolis, Minn. As shown in the accompanying views, an ordinary packing box 1 and 2 is employed through which the shaft or stem 3 passes. Within this box is located the packing which may be made of one or more sections, two being preferable in most cases. Each section consists of a cylindrical casing 4, within which is arranged a cage having fingers 7 forming between



them pockets. In these pockets are packing segments 10 which bear against the shaft or stem and are yieldingly maintained in position by springs 15. In assembling the packing, the sections are preferably arranged so that the free ends of the fingers of one section will engage the inner ends of the packing segments of the other section, and the parts are furthermore held against relative rotation.

New Amusement Device.

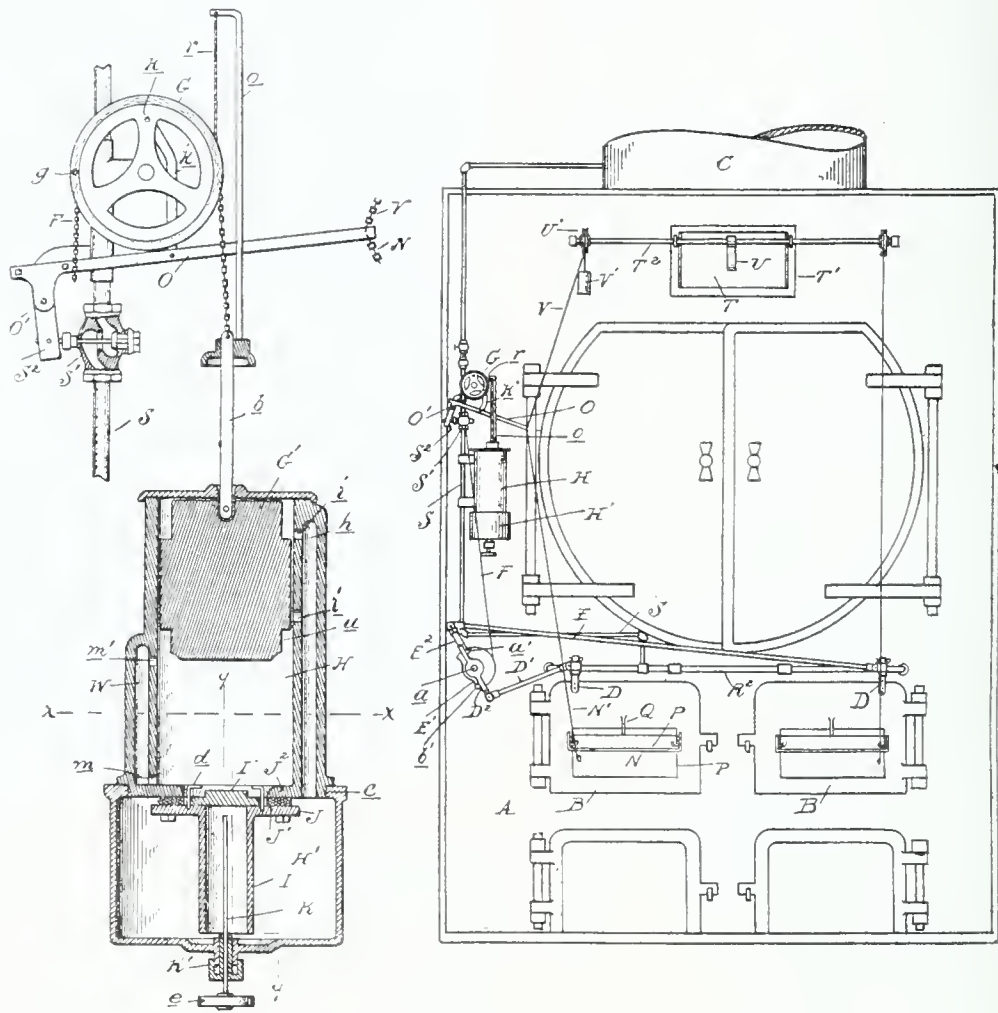
An ingenious amusement device for children has been recently patented by Mr. August Haye, of San Antonio, Texas. It is particularly adapted for gymnastic exercises, and combines a swing and trapeze, a horizontal bar, and a seesaw, the several parts being so arranged that they will not interfere, so as to accommodate several children at one time. As shown in the accompanying cut, a base 1 is employed that is mounted on sills 2 and supports upright standards 3 connected by a cross bar 4. The frame thus formed is suitably braced, as shown at 5 and 6. From the cross bar is hung a spring 7 having a



seat 8, and a trapeze 12 and 13. The swing or the trapeze can be hung at one side of the frame by means of the peg 14, so that either may be used without interfering with the other. A horizontal bar 15, has one end adjustably mounted in one of the standards 3, its other end being adjustably mounted in another standard 16 comprising portions of a frame 17 and 20 that is located at one side of the swing frame. The other side of the swing frame supports a horizontal arm 22 having seats 24, in which is placed the swinging-board 21 of a seesaw.

Draft Regulator.

Gregory H. Scharf, of Ypsilanti, Mich., has secured a patent on unique mechanism for regulating the draft of furnaces. The mechanism is so arranged that it is automatically set in motion by the opening of the furnace doors, and is fully shown in the accompanying illustrations. The doors B are provided with dampers P, and a damper T is also located in the stack. Steam jet nozzles R² are located over the doors and are supplied by a suitable pipe S from the boiler. In this pipe is located a controlling valve S¹. A cylinder H mounted on the front of the boiler contains a plunger G¹, the cylinder being connected by channels k and W with a reservoir H¹ located beneath it and constituting means of communication between the lower portion of the reservoir and the bottom of the sleeve, being controlled by an upwardly opening valve I¹. The furnace doors have connections D¹ and E with a drum E¹ that has a cable connection with the plunger stem b. The cable passes over a pulley G having a crank connection k with a lever O. One arm of the lever co-operates with the valve S¹. The other arm has cable connections N¹ and V with operating means for the dampers T and P. With this construction, when the doors B are opened, the plunger through the interposed mech-



anism is raised in the cylinder H, thus drawing in oil past the valve I¹. At the same time, the dampers P and T are opened, as is also the valve S¹. When the doors are again closed, the plunger G¹ is permitted to move down, but its downward movement will be comparatively slow, as the oil in the cylinder beneath it can only pass back slowly into the reservoir. The result is that the dampers are gradually closed and the steam jets in like manner cut off.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

WESTERN ELECTRIC CO. v. ROCHESTER TELEPHONE CO. et al.

(Circuit Court of Appeals, Second Circuit. Jan. 17, 1906. 145 F. R. p. 41.)

PATENTS—INVENTION—TELEPHONE SWITCHBOARDS.

The Scribner & McBerty patent, No. 559,411, for a signaling apparatus for telephone switchboards, is void for lack of patentable invention in view of the prior art.

THE FAIR v. MANNY LEMON JUICE EXTRACTOR CO.

(Circuit Court of Appeals, Seventh Circuit. April 10, 1906. 145 F. R. p. 175.)

PATENTS—VALIDITY AND INFRINGEMENT—LEMON JUICE EXTRACTOR.

The Manny patent, No. 415,048, for a lemon juice extractor (Claim 3), which claims broadly the combination of a base of dish form, a cone extractor having juice-releasing projections on its surface, and a strainer located above the bottom of the dish-formed portion of the base, is void for anticipation by the Mitchell British patent, No. 16,910, of 1889. Claim 4, which covers a specific modification of the Mitchell structure as limited thereby, held not infringed by the device of the Easley patent, No. 644,736, which embodies a different modification of the same combination.

MAYR et al. v. HOLMQUIST et al.

(Circuit Court of Appeals, Seventh Circuit. January 2, 1906. 145 F. R. p. 179.)

PATENTS—INFRINGEMENT—CURTAIN STRETCHING FRAME.

The Mayr patent, No. 617,813, for a curtain-stretching frame, is for a combination of old elements, and, in view of the prior art and of the rejection of claims by the Patent Office, contains but a single novel feature, which consists of so proportioning the metal base of the movable pins and the slot in which they move that when a curtain engages the projecting point the base will tilt, and its respective edges will bear against the opposite sides of the slot, thereby preventing the sliding of the pin. As so construed, it is not infringed by the device of the Hoffhims patents, Nos. 603,690 and 676,895, which accomplishes the same result by different means.

VICTOR TALKING MACH. CO. et al. v. AMERICAN GRAPHOPHONE CO.

(Circuit Court, S. D. New York. December 20, 1905. 145 F. R. p. 188.)

PATENTS—DECREE SUSTAINING VALIDITY—RESTRAINING PARTY FROM USING DECISION TO OBTAIN TRADE ADVANTAGE.

It is doubtful whether a court has power to compel a party to a decree sustaining a patent, to recall circulars sent out to customers stating the holding of the court, or to further advise the recipients of the circulars that the decree has been appealed from, and superseded by the adverse party, where the decision of the court does not appear to have been wilfully perverted.

VICTOR TALKING MACH. CO. et al. v. AMERICAN GRAPHOPHONE CO.

(Circuit Court, S. D. New York. February 19, 1906. 145 F. R. p. 189.)

1. PATENTS—CONSTRUCTION OF CLAIMS

The claims of a patent finally allowed and accepted by the patentee must be read in connection with the claims set forth in the original application and with the prior art, and cannot be construed to cover what was rejected or disclosed by prior devices.

2. SAME—NOVELTY—PRODUCT OF OLD PROCESS.

If a process is old and well known, the product of such process must likewise be considered as old in a patentable sense, and is not patentable as a separate and distinct invention.

3. SAME—INFRINGEMENT—SOUND RECORDS.

The Berliner patent No. 548,623, for duplicate sound records and method of making the same, in view of the prior art and the proceedings in the Patent Office, must be limited as to the material of which the duplicate records are made to hard rubber, which is that specified in each claim as allowed. As so construed, held not infringed.

GENERAL ELECTRIC CO. v. NATIONAL ELECTRIC CO.

(Circuit Court, E. D. Wisconsin. May 12, 1906. 145 F. R. p. 193.)

PATENTS—INFRINGEMENT—ARMATURE CORES.

The Reist patent, No. 508,637, for an armature core built up in sections of laminae, with separators of thin radial metal ribs to secure ventilation, was not anticipated, and discloses patentable invention, and a device of great utility and merit. Claims 2, 4, and 6 also held infringed.

LAAS et al. v. SCOTT et al.

(Circuit Court, E. D. Wisconsin. May 3, 1906. 145 F. R. p. 195.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

On an application for a preliminary injunction to restrain infringement of a patent, by a defendant over whom complainant prevailed in interference proceedings in the Patent Office and in the Supreme Court of the District of Columbia on appeal therefrom, the judgment of such court creates a presumption in complainant's favor as to the question of priority of invention, and, where that is the only question in issue, entitles him to the injunction, unless overcome by proof establishing defendant's contention beyond a reasonable doubt.

VANT WOOD RUBBER CO. v. STERNAU et al.

(Circuit Court, S. D. New York. April 27, 1906. 145 F. R. p. 197.)

PATENTS—SUIT FOR INFRINGEMENT—SUFFICIENCY OF BILL.

A bill to recover damages and profits for infringement of a patent, which merely alleges that it was issued in due form of law on application to the proper department of the government, and while alleging title in complainant by assignment does not show the date of such assignment, nor that it carried the right to past damages, is insufficient.

HOGAN v. WESTMORELAND SPECIALTY CO.

(Circuit Court, E. D. Pennsylvania. May 3, 1906. 145 F. R. p. 199.)

1. PATENTS—SUIT FOR INFRINGEMENT—DEMURRER.

By profert of a patent in a suit for its infringement it is carried into the bill, and, if it is plainly devoid of invention on its face, a demurrer to the bill on that ground is well taken, and must be sustained.

2. SAME—INVENTION—SALT AND PEPPER DREDGE.

The Hogan patent, No. 752,903, for a dredge for salt or pepper, having the cap made of celluloid, is void on its face for lack of patentable invention; there being no invention in the substitution of celluloid, the qualities of which were well known, for other materials previously used for making such caps.

KEASBEY & MATTISON CO. v. H. W. JOHNS-MANVILLE CO.

(Circuit Court, S. D. New York. March 6, 1905. 145 F. R. p. 202.)

PATENTS—INFRINGEMENT—MACHINE FOR MOLDING TUBES.

The Keasbey patent, No. 397,860, for a machine for molding tubes, discloses invention, and the patentee was the inventor. Also held infringed.

COMPTOGRAPH CO. v. MECHANICAL ACCOUNTANT CO.

(Circuit Court of Appeals, First Circuit. May 4, 1906. 145 F. R. p. 331.)

1. PATENTS—INFRINGEMENT.

Infringement is not avoided by the fact that the defendant's device performs some other function additional to that of the patented device.

2. SAME—COMPUTING MACHINE.

The Felt patent, No. 465,255, for a computing machine, claims 1 and 8, which cover a subtraction cut-off, are for a combination and not merely an aggregation of parts, and disclose invention. Also held infringed.

H. C. COOK CO. v. LITTLE RIVER MFG. CO.

(Circuit Court of Appeals, Second Circuit. April 2, 1906. 145 F. R. p. 348.)

PATENTS—INFRINGEMENT—NAIL CLIPPERS.

The Wenger patent, No. 569,903, for finger nail clippers, while narrow in scope, was

not anticipated and discloses invention. Also held infringed as to claim 1, but not as to claim 2.

VICTOR TALKING MACH. CO. et al. v. AMERICAN GRAPHOPHONE CO.

(Circuit Court of Appeals, Second Circuit. March 1, 1906. Rehearing Denied April 23, 1906. 145 F. R. p. 350.)

1. PATENTS—ABANDONMENT OF INVENTION.

Pending an application for a patent, the specification of which is broad enough to warrant the making of certain claims which are not made, the applicant, instead of inserting such claims by amendment, may at his election make them the subject of a new application, which in such case may fairly be considered a continuation of the first, and their omission therefrom will not operate as an abandonment.

2. SAME—INFRINGEMENT—GRAMOPHONE.

The Berliner patent No. 534,543, for improvements in talking machines, was not anticipated, and discloses patentable invention; nor is it invalidated by prior public use or abandonment. Claims 5 and 35 also held infringed.

W. & J. SLOANE v. DOBSON et al.

(Circuit Court, S. D. New York. March 5, 1906. 145 F. R. p. 352.)

PATENTS—INVENTION—FASTENER FOR STAIR CARPETS.

The Adams patent, No. 587,633, for a fastener for stair carpets, is void for lack of patentable invention in view of the prior art.

BRUNSWICK-BALKE-COLLENDER CO. v. BEYER.

(Circuit Court, S. D. New York. March 5, 1906. 145 F. R. p. 353.)

PATENTS—INFRINGEMENT—BOWLING ALLEY.

The Wiggins patent, No. 623,933, for a bowling alley, discloses novelty, utility, and patentable invention. Also held infringed.

NATIONAL ELECTRIC SIGNALING CO. v. DE FOREST WIRELESS TELEGRAPH CO. et al.

(Circuit Court, S. D. New York. April 7, 1906. 145 F. R. p. 354.)

PATENTS—INFRINGEMENTS—WIRELESS TELEGRAPHING APPARATUS.

The Fessenden reissued patent, No. 12,115 (original No. 727,331) claims 11, 23, and 25, for a receiver for electro magnetic waves consisting of an extremely fine terminal "projecting into" a liquid, are infringed by the use of a metal strip 1-32 of an inch wide, but inclosed in glass to the extreme edge, leaving an extremely fine area the end of which touches the surface of a similar liquid, the fine edge of the strip being the equivalent of the fine wire of the patent and the projection of such wire into the liquid as explained by the specification of the patent being merely such as to insure a perfect contact which is made if it touches the liquid.

STANDARD ROLLER BEARING CO. v. HESS-BRIGHT MFG. CO.

(Circuit Court, E. D. Pennsylvania. May 4, 1906. 145 F. R. p. 356.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction should not be granted to restrain an alleged infringement of a paper patent issued more than 16 years before suit, the validity of which has not been established by adjudication or public acquiescence, and where there is a strong showing of anticipation.

HARTMAN v. JOHN D. PARK & SONS CO.

(Circuit Court, E. D. Kentucky. February 14, 1906. 145 F. R. p. 358.)

1. PROPERTY—SECRET PROCESS—INCIDENTS OF OWNERSHIP.

The patent and copyright statutes, in conferring upon an inventor or author the exclusive right to make use and sell articles embodying his invention or authorship, create in him a new right and do not extend or continue a previously existing right. The owner of a secret process, not patented, has no such exclusive right to make, use and vend the article to which it relates, but he has the right to keep his knowledge to himself and to protection of the same as a property right against one, who, in violation of contract or through a breach of trust or confidence, undertakes to apply the secret to his own use or to impart it to others.

2. SALES—RIGHT TO RESTRICT FUTURE SALES—EFFECT OF PATENT.

The owner of a patent or copyright after an absolute sale of the article covered thereby may, by virtue of the exclusive right

given him by statute, and his right to withhold or restrict licenses under his monopoly, retain control of future trade in the article sold, as to prices of resale, etc., irrespective of any condition in the contract of sale, but the right to reserve such future control by contract is not derived from the statute, but exists if at all by the common law, and may as lawfully be exercised by the seller of an unpatented article.

3. CONTRACTS—RESTRAINT OF TRADE—SALF OF ARTICLE MADE BY SECRET PROCESS.

Provisions in a contract for the sale of a secret process restraining its use or its communication to others are not invalid as in restraint of trade, because necessary to protect the property right in the subject-matter of the contract, but such considerations do not apply to contracts for the sale of the article produced by such process which are subject to the same rules as contracts for the sale of any other article of manufacture.

4. SAME.

A system of contracts made by the manufacturer of a proprietary medicine between him and wholesale dealers, to whom alone he sold his medicine, by which they were bound to sell only at a certain price and to retail dealers designated by him, and between him and the retail dealers by which, in consideration of being so designated, they agreed to sell to consumers only at a certain price, is not unlawful as in restraint of trade, but is a reasonable provision for the protection of the manufacturer's trade, and he is entitled to an injunction to restrain a defendant from inducing other parties to such contracts to violate the same.

IMPERIAL MFG. CO. v. MUNSON SUPPLY CO. et al.

(Circuit Court of Appeals, Second Circuit. April 23, 1906. 145 F. R. p. 514.)

PATENTS—INFRINGEMENT—TYPEWRITER KEYS

The Graham & Savell patent, No. 504,065, for a cushioned cap for typewriter keys, held valid, on appeal from an order granting a preliminary injunction, and infringed by one form of defendant's construction, but not by another form.

CORTIS v. AMERICAN STREET LAMP & SUPPLY CO. et al.

(Circuit Court, S. D. New York. March 2, 1906. 145 F. R. p. 516.)

1. PATENTS—INFRINGEMENT—LAMP.

The Cortis patent, No. 613,648, for a lamp, the essential element of the combination shown being a spring support or cushion for carrying the chimney-gallery and mantle-support in lamps using an incandescing mantle, to prevent injury to the mantle from jars or shocks, is not infringed by the mantle supporting device of the Momand patent, No. 781,613.

2. SAME—LAMP CHIMNEY.

The Marsh patent, No. 652,730, for a lamp chimney, claims 1, 2, and 3, the essential element of which is an adjustable support for the upper portion of a sectional chimney for use on lamps having an incandescing mantle, must be limited to the precise construction shown in view of the prior art, and, as so limited, are not infringed by the chimneys shown in the Momand patent No. 791,355.

WELSBACH LIGHT CO. v. CREMO INCANDESCENT LIGHT CO.

(Circuit Court, S. D. New York. March 9, 1906. 145 F. R. p. 521.)

1. PATENTS—CONSTRUCTION OF CLAIMS—CHANGES IN PATENT OFFICE.

The claims of a patent as allowed must be construed with reference to the action of the Patent Office thereon as the prior art; they are not affected by a mere change in the wording at the instance of the Patent Office which leaves the substance unchanged, but, if narrowed, in scope, and so accepted by the applicant, he is bound thereby.

2. SAME—INFRINGEMENT—LAMP APPLIANCE.

The Heald patent, No. 423,307, for an appliance for use with incandescing gas lamps, cannot be construed to cover, as a part of the invention, the removable tubular support for the lower end of the mantle and the supporting rod, which was old, and a claim therefor rejected by the Patent Office, but is limited to the feature of the refractory ring support at the top of the mantle. As so limited, held not infringed.

SEEBERGER v. RENO INCLINED ELEVATOR CO.

(Circuit Court, S. D. New York. December 1, 1905. 145 F. R. p. 532.)

PATENTS—INFRINGEMENT—STAIRWAY.

The Wheeler patent, No. 479,864 for a stairway, construed, and held not anticipated, valid, and infringed as to claims 6 and 10, and not infringed as to claims 7, 11, and 12.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

Winfield S. Cannaday, Florence, Ala. Delinting Machine.—This is an exceedingly novel structure for delinting cotton seed, which will completely remove the lint without cracking or injuring the seed. It consists of an upright casing, in which a vertical series of retarders and delinting brushes are located, the brushes co-operating with the retarders. Vertically arranged air conduits are disposed in rear of the brushes and deliver to condensing devices. The seed is introduced through the top of the casing and falls from one retarder to another. While in these retarders, the brushes operate on the seed and thoroughly delint the same. The lint thus removed is drawn into the air conduits, and finally delivered to the condensers, the different grades being automatically sorted and separately condensed.

George C. Pyle and Albert C. Pyle, Beatrice, Nebr. Tank.—The object of these inventors is to provide a novel and exceedingly simple structure, which is adapted to be shipped in knock-down condition and set up at the place of use. The structure constitutes an efficient tank or reservoir for containing liquids or other materials, and has joints that may be thoroughly packed and tightened to prevent leakage. The tank has a bottom provided with an annular groove, in which packing is placed. The walls of the tank are of sheet metal having overlapped margins and outstanding flanges. Bolts are passed through the flanges to bring the margins together, and packing is interposed between the flanges. The lower marginal portions of the side walls have an inset rib that engages the groove of the bottom, and a clamping ring is placed around the same to hold the parts in place.

William F. Robinson, Anacortes, Wash. Drier.—The invention is particularly intended for drying fish and the products obtained therefrom, but it is undoubtedly useful for other purposes. It consists of a circular chamber having an annular side wall of peculiar construction. The side wall consists of an outer imperforate casing, an inner slatted sheathing, and a door-way. The door comprises horizontally disposed frame pieces that are perforated, a casing section secured to the outer sides of the frame pieces, and a perforate sheathing section secured to the inner sides of the frame pieces. Combined with this is a rotary fan located within the casing and directing the air outwardly toward the annular walls thereof. Material is placed directly within the chamber, and the air, forced outwardly by the fan, evaporates the moisture therefrom and drives it through the outer walls.

Alan Stewart, Camden, N. J. Water Heater and Feeder for Steam Boilers.—The object in the present case is to provide novel and simple means whereby feed water can be heated by the steam from a boiler before its entrance to such boiler, and after being so heated, may be permitted to flow by gravity into the boiler, the structure being such that it can be readily understood and properly operated by an unskilled person. A feed water reservoir is employed that has its bottom above the body of the boiler. A valved steam pipe connects the dome and the lower portion of the reservoir. Another valved steam conduct-

ing pipe connects the upper portion of the dome of the boiler and the upper portion of the reservoir. Suitable means are employed for supplying water to the reservoir, and a valved water conducting pipe connects the lower portion of the reservoir and the body of the boiler. By this arrangement, steam can first be admitted to the reservoir to thoroughly heat the water, after which this heated water can be introduced directly into the boiler.

Paul S. Butterworth and Stephen F. Hart, Ashland, Va. Stamp.—The patent covers a hand stamp designed to carry a plurality of designations or names, any one of which can be brought into proper position for marking purposes. The stamp consists of a frame with a handle secured thereto, and a revoluble head journaled on the frame and having longitudinally disposed guideways. Name plates or other devices to be marked are detachably fitted in the guideways. A toothed wheel is secured to one end of the head, and a spring dog is yieldingly secured to the frame, and has a downturned end portion provided with an inwardly extending free terminal that slidably engages with the frame and detachably engages with the teeth of the wheel to hold the head against rotating.

Rudolph C. Hoyer, St. Louis, Mo. Seal.—Mr. Hoyer has devised a seal for envelopes and other containers, which can be readily applied, and will prevent the contents thereof being tampered with or abstracted without mutilating the same. The seal comprises angularly disposed leaves arranged to embrace the flaps of an envelope. A rearwardly turned tongue is carried by one of the leaves, and has an opening therethrough. Said tongue is spaced from the leaf and has inwardly projecting teeth. Another tongue is carried by the other leaf, and is arranged to be passed through the opening of the first-mentioned tongue and lie between the same and the leaf thereof. The latter tongue also has teeth. In applying the device, one leaf and its tongue is located inside the envelope, the other is then passed through the sealed flaps and interlocked with the inner tongue and leaf, thus securing the parts effectively in place.

Augustus B. Carrier, Battle Creek, Mich. Air Brake Valves.—The invention relates more particularly to the couplings between the cars, and the same is so arranged that when a break in a train takes place, the train pipe in the rear section is opened to apply the brakes, while the rear end of the train pipe on the front section is closed. The brakes are consequently left under the control of the engineer, and the result is that accidents can thus be avoided. The coupling member comprises pipe sections, one of which has at one end a transversely disposed hub provided with an opening, the other section has a socket that receives the hub. Journal rings are carried by the latter section and surround the ends of the hub, one of the ring elements having a plurality of teeth. A dog is pivoted upon the first section and is arranged to engage the teeth to hold the sections with the passageway and opening out of alinement, and another dog is carried by the first section and engages the second section for holding the sections with the passageway in alinement.

George W. Fallin, East Lake, Ala. Carbureting Apparatus.—This invention relates to apparatus employed in generating gas from hydrocarbon by the admixture of air and hydrocarbon oil and the vaporization of the latter by the former. The object is to provide novel means of a simple nature for effecting the thorough and proper

vaporization of the oil without the necessity of the employment of heat, and to secure the automatic proportional regulation of the air and hydrocarbon without regard to the amount of gas being used or generated. The carbureter consists of a casing having perforate partitions and absorbent material located between the partitions. A hydrocarbon reservoir is employed, and a compressed air reservoir has communication with the hydrocarbon reservoir. An air pipe is employed that has a discharge extending into the casing of the carbureter through certain of the partitions. This pipe is provided with lateral perforations. A hydrocarbon supply pipe is connected to the reservoir, and has an offset discharge nozzle located within the air pipe contiguous to its connections with the carbureter. A movable gas holder is employed. Valves control the air and hydrocarbon supplies, and gears connect the valves for moving the same different relative distances so that when one is opened the other will be opened in proportion.

Winfield S. Shelton, Lakeside, La. Pump.—The invention relates to pumps of that character wherein rotary pistons are employed, and one of the principal objects is to provide an exceedingly simple structure, which will permit the ready removal of the piston without the necessity of dismembering the remainder of the pump. Another and important object is to provide novel pump mechanism that will have a comparatively great capacity without materially increasing the bulk of the same as a whole. A casing is employed having a piston chamber formed therein between its top and bottom and comprising a top and bottom wall. These walls have openings, the upper of which is larger than the lower. A piston mounted on a suitable shaft is arranged within the piston chamber, and comprises upper and lower disks having inlet openings, the upper disk operating over the opening in the upper chamber wall, the lower disk operating over the opening in the lower chamber wall, and being of less diameter than the upper disk. An intermediate disk is interposed between the upper and lower disks, and blades are secured between the disks. Inlets are formed in the opposite side walls of the casing, and located over the same is a partition comprising separable sections hinged to the sides of the casing and extending across the same. This construction permits the ready removal and replacement of the piston, as the sections swing out of the way when the piston is raised.

George S. MacLeod, Winnipeg, Canada. Cam.—The cam covered by the patent is particularly intended for stamp mills. It consists of a body that is keyed upon a shaft, and has oppositely extending wings provided with tapered dovetails on their outer edges. Shoes are slidably mounted on the wings and have grooves that receive the dovetails. A novel key is employed for securing the shoes in place. By this means, when the cam becomes worn, all that is necessary to renew it is to substitute new shoes for the old ones, and it is not necessary to detach the cam from the shaft.

George S. MacLeod, Winnipeg, Canada. Wire Fencing.—Heretofore wire fencing has been constructed with spurs or rowels, designed, when an animal comes in contact with them, to rotate and thereby prevent serious injury, which is inflicted when an animal runs against an ordinary barbed wire fence; but owing to the arrangement of such spurs or rowels between the twisted strands of the wire, the latter when stretched to the proper tension, has interfered with the rotary movement of such spurs or rowels, and such fences have been as injurious to

stock as an ordinary barbed wire fence. The object of the present invention is to provide a wire fencing, having spurs or rowels so arranged that the fence wire may be stretched to any desired tension, without affecting the free rotary movement of the spurs or rowels. This wire fencing is composed of twisted strands, and a pivot fitting between the strands and projecting beyond the same, the projecting portion of the pivot having a rotary spur or rowel mounted thereon.

Dr. James M. Shepard, Findlay, O. Three patents.—The first patent relates to a pump for compressed air water elevator. In this invention, the air or driving fluid is brought into coaction with the water or liquid to be elevated so that the force of the former will be very effectively utilized on the latter, a continuous flow of the liquid being secured with a comparatively small expenditure of force. The submergence moreover is comparatively slight, and the construction is such that should the occasion arise, the pump complete can be readily removed and replaced without the necessity of pulling out the well tubing or casing.

In the construction disclosed in the patent, a barrel is employed having a tapering seat in its lower portion. A standing valve member includes a tapering plug that engages in the seat, and a depending tube section projects therethrough. A tubular section is secured to the standing valve member and extends above the same, while a head connected to the upper end of the tubular casing, has openings therethrough. Upwardly extending nozzles are carried by the head and project above the same, and a fluid chamber also carried by the head, extends within the tubular casing, and is in communication with upwardly extending fluid discharge openings formed in the head. A supply pipe, connected to the head, communicates with the fluid chamber.

The second patent covers a vehicle tire so constructed that access to the interior of the tire may be secured without the necessity of removing it from the wheel. The tire consists of an outer casing, the outer wall of which is in sections, and the joint between these sections is closed by a lip or tongue carried by one section and extending beneath the other. An inner tube is located within the casing, and between the tube and the inner wall of the casing is a strip from which extend holding bolts that pass through the inner end of the casing and through the rim of the wheel. The outer sectional wall is covered by a shoe of novel construction, consisting of peculiarly arranged links having ears that fit in sockets in the wall sections. Transverse holding bolts pass through the ears and the outer sectional wall of the casing, and serve to hold the wall sections together and retain the ears in the same.

The third patent relates to curtain fixtures, and aims to provide a simple and efficient device, adapted to be readily applied to either side of a window, and capable of supporting a window shade or curtain and curtain pole, and having provision for ready adjustment to suit the length of a curtain roller. The fixture comprises a vertical attachment plate, a bracket rigid with the plate and provided with a horizontal slot, a curtain pole supporting slide having a seat to receive a curtain pole, means connecting the sides of the slide and operating in the slot of the bracket for securing the slide in its adjustment, a transverse guide located below the bracket, said guide being provided with a longitudinal opening, a curtain-roller-supporting slide operating in the longitudinal opening of the transverse guide and adapted to be inserted in either end thereof, and means for securing the curtain-roller-supporting slide in its adjustment.



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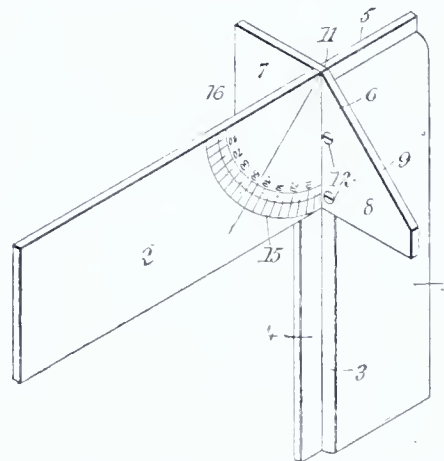
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The Most Inventive States.

An interesting paragraph of the last report of the Commissioner of Patents deals with the distribution of patents according to States. It appears that the citizens of Connecticut carried off the palm for inventive effort last year, more patents being issued in proportion to population than in any other State, or one to every 1,074. It is not surprising to find that the District of Columbia ranks second, as we have the Patent Office always with us, and familiarity has bred confidence. When a Washingtonian has evolved a new mechanical device, it is so easy and "handy" to have it protected that he seldom fails to take advantage of the opportunity. But it is a far cry from these Eastern districts to the shore of the Pacific, and so it is rather surprising to find that California comes next on the list, with one patent to every 1,331 inhabitants. Colorado and Rhode Island, in spite of the wide distance separating them, almost tie for the next place; then came New Jersey, Illinois, New York, Washington, Massachusetts, Ohio and Pennsylvania. The majority of the other Western states follow, until the proportion reaches well within the six thousands, when we have Florida, Virginia, New Mexico, Texas, etc. The fewest patents granted in proportion to number of inhabitants were in Mississippi—15,000, and South Carolina—18,000.

Not a few foreigners availed themselves of our liberal laws to obtain industrial protection last year—the total being in round numbers 3,500. England and Germany divided half of these between them, but there was a wide distribution, some inventors hailing from such unexpected quarters as Algeria, British Guiana, Sierra Leone and Tasmania. There were very few countries that were not represented somewhere on the list.

The assertion has often been made that the industrial supremacy of the United States is due largely to the fertility of invention among Americans, which in recent years has been likened to a tidal wave of human in-

genuity and resource. In corroboration of this, it is of interest to note, from a table in the Commissioner's report, that of the patents issued by all countries from 1871 to 1906, almost half were in the United States, our country leading with a total of over 700,000, while England, the next nearest country, follows far behind with about 300,000. Last year alone, over forty thousand patents (including trademarks, designs, etc.) were granted, and the number is steadily increasing. It is to be hoped that a large business establishment, such as the Patent Office really is, will not be denied the proper facilities for keeping up its work, but that Congress will appropriate funds to allow for the continued expansion.

The Steel Trade.

It is certainly a surprise to hear the American steel trade called non-progressive, and yet that is the accusation made by Herbert Casson in a recent number of Munsey's Magazine. Steel is not only one of our leading industries, but it is one of the foundations of the industrial supremacy which distinguishes the United States among the nations of the world. Its growth has been unprecedented. A generation ago, we produced very little steel; now, nearly half of the steel output of the globe comes from our furnaces. Men not yet old have witnessed the development of the industry from an insignificant beginning to its present colossal proportions. Carnegie himself, when a young man, declared that we could never export steel in competition with Great Britain. The future of the American steel business, he said, was in the home markets; the outside must be left to the British. How his prediction was falsified, and how we send steel products to the uttermost ends of the earth, outselling the English at the very doors of their own factories, and how this revolution has made more millionaires than were ever before created in a similar industrial period, (not least among them Carnegie himself) every schoolboy knows. And this development was due not only to the discovery of huge deposits of iron ore, but to the use of the best mechanical means of handling it. New and improved machinery was constantly introduced into our plants; it shocked our conservative British and German visitors to see good apparatus consigned to the scrap heap unhesitatingly, in order that something better, a device that would save a few minutes' time out of the 24 hours, might be substituted. The American steel trade owes a heavy debt to invention; and as we said above, it is surprising to hear it called unprogressive. But, Mr. Casson asserts, in spite of the admirable organization of the steel industry, it has no department of invention, in which original suggestions can be treated with respect and fairly tested. The battle against conservatism and self complacency is not ended. Fifty years ago, when Kelly and Bessemer—pioneers in the American and British trades respectively—pointed out the path to millions, they were treated as

impertinent meddlers by the steel men. When Bessemer read a paper before the British Association for the Advancement of Science, on "The manufacture of malleable iron and steel without fuel," describing his process for using an air blast instead of charcoal, every British steel maker roared with laughter at the "crazy Frenchman," and it was voted not to mention his "silly" paper in the minutes of the association. And the trade today has the same conservative attitude. Heart-sick inventors tramp from one corporation to another, flouted by clerks and bullied by superintendents. Although the secret of American supremacy in steel is the application of intelligence and inventive genius to every department, innovations must still be forced through by the aggressive few.

One of the innovations is the making of steel direct from the ore. Edison is giving his attention to the problem, and the Canadian government has appropriated money for experiments in this line. But it seems that Europe has gotten ahead of us in the matter, for as seen in another column of this edition, the Germans have a large and successful industrial plant where this method is carried out. It has been working for over a year, and has gotten far beyond the stage of experiment. Another step forward that may be expected in the near future is the dry blast. The object of this is to take the moisture out of the air that is blown into the furnace. This is not a small item. The air blown into a furnace in one hour contains from 40 to 300 gallons of water. The new plan is to carry the air first through an ammonia chamber, which takes out the moisture in the form of frost. When the chamber is clogged with frost, hot brine is forced through the pipes. This dry air produces a hotter fire with less coke. Many other inventions are running the gauntlet, and since so many ideas have mastered the obstinacy of custom, and so many dreams have come true in the wizardry of steel making, it has become a futile and unprofitable thing to declare that any proposed improvement is impossible.

New French Loom.

A decided improvement in weaving is reported from France, in the shape of an invention that suppresses the use of checkered cards in revolving looms. At present, in weaving stuffs of varied wafts, special cards must be employed for effecting a change of shuttles. This system has many inconveniences, among others being the expense of introducing a new set of cards whenever shuttles are changed; the loom also is encumbered by the same set of cards. By the new system, these troublesome checkered cards are suppressed and replaced by a perforated metallic ribbon mounted on an extensible wheel. The ribbon thus forms a disk which will serve for all kinds of shuttle work, whatever the number of shuttles to be employed and the number of picks. This new device may be used for all species of designs, and will increase rapidity of production. The latter advantage will be noted especially in making novelty and fancy goods, where the operator must change the shuttles repeatedly. It will even be possible to make changes in design while the machinery is in motion.

Electric Steel Smelting.

The smelting of steel by electricity has long been regarded as the dream of a visionary. While it has been found possible to smelt ore in this manner in the laboratory, the cost has been such as to put it beyond the reach of practical application. During the past few years the technical literature of many countries has teemed with reports regarding smelting processes by electricity, but few if any of these have stood the test of actual operation. Kelly, one of the leaders in the iron industry in the United States, believed that both the blast furnace and the converter should be abolished, as unnecessary middlemen. The problem was not solved during his life, but according to a consular report from Germany, an electrical process has recently been tried in that country with such success that the plant is about to be enlarged.

A party of American engineers who were visiting Prussia some months ago were shown over the establishment, which is located at Remscheid Haston. It produces high grade steel from the most ordinary scrap iron rubbish of the cheapest kind and quality. Its condition is quite immaterial, as by the process all damaging substances, such as sulphur and phosphor, are practically eliminated, being reduced to one hundredth of 1 per cent. This rubbish is melted in a tilting furnace or oven, constructed similarly to those used in our own smelting works. After being reduced to a fluid state, it is poured and conveyed in a retort by a traveling crane to the electric oven, which has a capacity of nearly two tons. In this oven the necessary quantities of carbon, manganese, silicon, nickel, tungstate, arsenical iron, etc., are added, to produce any kind or quality of steel desired. The whole process of production takes from two to two and a half hours.

The developing bath is heated by an electric current of 100-volt tension, which is brought into connection with the oven by means of a carbon electrode and carried back to the current by a second coal electrode, both of these electrodes being suspended perpendicularly through the top of the oven and adjustable so as to nearly come in contact with the melted mass. The current leaps from the first electrode in a wide, mighty voltaic arc, and passes through the mass to the second electrode, thus producing the requisite degree of heat sufficient for the purifying and finishing process.

The casting molds for the electric steel are the same as are used in any other factory. The cost of production depends upon many points which will become clearer after further experience with the new process. Raw material, fuel, current and wages, depend largely upon the locality, etc., but it is safe to say that an average quality of steel, as heretofore produced by the crucible process, can be made by the electric process for \$24 per ton. A great saving, it is said, could be made by having larger ovens, as the current could be proportionately reduced. No damage to

the steel from the electrodes has ever taken place, as they are not allowed to come in contact with the steel.

The plant produces almost exclusively high-grade and alloy steel, for which there is a demand by the immense tool, cutlery and skate factories in the neighborhood. The electric steel surpasses that produced by any crucible, both in quality and chemical purity. By this system the steel is freed and kept clear of all gas and bubbles, which has never been possible with the old methods. The advantage of the electric steel is not only its purity, but the fact that it allows the introduction of 20 to 30 per cent more carbon than the crucible steel. It can be forged easier, and is not easily affected by the damaging influences of overheating: it is stronger and more firm, and offers greater resistance to wear and tear. As noted, also, very cheap material can be used for producing it. The electric process is based on scientific metallurgical principles, while crucible steel is dependent on the use of the most expensive ores.

Glass as Fire Protection.

Wire-glass, a glass with wire netting imbedded in it, is used extensively to protect against burglars, as it cannot be cut through without making a noise. It also has fine fire-proof qualities, as some forms of it are said to stand 1,700 degrees of heat for half an hour at a time. When the heat of a conflagration begins to play on it, the glass will crackle, but the wire holds it together and keeps the flame from passing through. When it melts almost to the running point, a stream of water played upon it will cause it to solidify immediately.

Wire-glass was first made in a rough form, but now a highly polished plate glass, ornamental in character, is on the market. In New York it is used in some places instead of iron shutters, as protection against fire from neighboring buildings. Wire-glass windows are even fitted with an automatic arrangement which causes them to close if the temperature rises suddenly.

Bicycle Wireless System.

Some of the European armies, says the *Pathfinder*, are making use of a unique form of wireless telegraph for the transmission of messages. It is a portable affair. The antennae are supported by a long steel pole which is cut up into sections and is joined together like a jointed fishing pole. After being set up, steel guy ropes hold it in place. In a tent near by is the receiving and sending apparatus which is in connection with the steel pole. A dynamo is included in the outfit, this being driven by man power. A bicycle arrangement is set up near the pole, a man mounts the seat and pedals away just as a bicycle rider does. The machine is stationary, and the power exerted generates enough electricity to operate the wireless system. Only two men are required to operate the outfit, while some 8 or 10 are necessary to transport it.

Caisson Work.

We hear a great deal these days about the use of caissons in tunneling, and especially in constructing the foundations for the sky scrapers that are rising like mushrooms in our cities: but few people outside of the initiated engineers and scientists, know just what a caisson is. The term is from the French, and evidently has the same derivation as "cone," since the first caissons used by the French were shaped like a cone, and date back at least two centuries. As now constructed, a caisson is simply a great wooden box, built of exceedingly heavy planks and braced with strong timbers, having a bottom like that of a strawberry box: that is, its bottom is some ten or twelve feet above the lower edge of the sides, so that the floor of the upper portion joins the ceiling of the subchamber. The walls of the chamber are made of heavy timber and are covered inside and out by a sheeting of thick plank, the crevices being caulked with oakum. Internally, the chamber is powerfully braced in every direction by timbers twelve inches square. These braces serve not only to keep the walls from caving in from the enormous pressure on the outside, but to support the ceiling, which is loaded with concrete, stone, cement and sand over its whole surface and to the very top of the enclosure: indeed, it is this great box full of concrete which, when the lower chamber has also been filled with the same material, forms the foundation for which purpose the caisson was built.

The steel tubes projecting above the surface, which anyone can see during the preliminary stages of sky-scraper construction, are simply passage ways through the concrete filled portions down to the braced but otherwise empty chamber in which the men work, and are used for ascending and descending. When work is begun, the earth is dug away until marsh, quicksand, or some such unsubstantial foundation is reached. The air-tight box then rests on the sand like an inverted glass, the workmen being admitted by air locks after the water is driven back by pneumatic pressure. The object is to sink the caisson until a foundation of hard pan or bed-rock is reached, and this is done by the diggers, or sand-hogs, as they are called, who work in the lower chamber and remove the supporting earth from the bottom and under the side walls. As this is done, the enormous weight of the loaded caisson continues to sink until the bottom has been reached. The lower chamber and the steel tubes are then filled in with concrete, which hardens like stone with the passage of time, and thus a foundation is made which will support the loftiest building or the heaviest bridge.

But it must have occurred to the reader to ask what prevents the weight of water and sand outside the caisson from forcing into its interior cavity. The answer is, nothing but air pressure, just as the air inside an inverted glass submerged in water prevents it from rising to the level of the water outside the glass.

Air compressors working day and night constantly supply the sub-chambers with air under such a pressure that the equilibrium is maintained at all times, and unless an accident to these happens, a cave-in cannot occur. All this means, of course, that the workmen must live under an air pressure to which they are not adapted by nature. The work is full of danger, and the "sand hogs" must have good constitutions—especially sound hearts—and even then can work only four hours at a time.

While the caisson method was used in river work a 100 years or two ago, it did not come into practice for building foundations until the last decade. This surprising fact is due to the following conditions: The caisson is reached through a tube surmounted by what is called an air lock, namely a double compartment having two air-tight doors, one of which must always be closed. In river work, a device termed a blow pipe is utilized to remove the finer materials, such as muck: but by this method, the settlement of the material surrounding the caisson results.

When caissons were first employed in building foundations, this untoward condition was quickly noted, and it will be observed at once that the settlement of the surrounding material must cause a corresponding settlement of buildings adjacent to it, as well as streets supported by it. So a lock was invented, which made it practically possible to employ caissons without the use of blowpipes.

This lock renders possible the passing of a bucket from the inside of a caisson to the outside in a single continuous operation, by a derrick and hoist engine without unhooking the rope from the bucket. Prior to its invention, anything taken in or out of the caisson must be landed in the air lock by one rope and then hoisted or lowered by another. In the old lock, a man must pass through each time the lock was operated, because all the valves were controlled only from the inside. The doors of the new lock are all controlled from the outside.

Great care must still be exercised, however, in sinking caissons, for if the pressure of air is lessened from any cause, the surrounding quicksand will flow rapidly into the caisson and thereby cause a settlement in adjoining buildings. Some buildings have been seriously injured and even wrecked by the careless handling of near-by caissons.

One of the curious phases of caisson work is the danger from fire where the air pressure is so much greater than that of atmospheric air, on account of the excess of oxygen. Water-soaked material, in caissons, will burn like kindling wood.

Hot Gases for Power.

Among the many sources of power, now wasted, that might be utilized in future, are the gases from coal and coke furnaces. By installing an electric plant, light and power can be obtained in the vicinity of such establishments at a minimum expense. The hot gases are used as power to drive the dynamos, and operate most successively whenever tried.

Products from Peat.

The use of peat as fuel has often been discussed in the press, and various experiments have demonstrated that in case of a failure of our coal supply, we would not be left altogether comfortless, but could find a fairly efficient substitute in the earth on which we tread. As long, however, as we can obtain coal so easily, no effort will be made to manufacture the machinery necessary for preparing the peat for use. Americans prefer to submit to the extortions of the coal trust, rather than to take the trouble to adopt a substitute fuel—one which is widely used in countries where coal is unknown, and where the extremes of temperature are as great as with us.

But there are other products of which peat is the basis, which may interest the public. There is peat straw and wool, paper and pasteboard, tiles and bricks for paving and building purposes, and even fodder for animals. A scientist has succeeded, by treating the cleansed vegetable fibres of peat moss with the waste molasses of sugar manufacture, in producing a compound that serves acceptably as food for domestic animals.

Peat straw is simply the woolly fiber cleansed, dried and baled for various uses. It is generally of a light brown color, spongy in texture, light, clean and with an extraordinary power of absorption for gases or liquids. It has long been used in Europe in preference to straw, leaves, or any other material as litter in stables for horses or cattle. It will absorb ten times its weight of ammoniacal liquids—more than three times as much as wheat or rye straw—and when saturated is piled and allowed to rot, by which it forms a humus of the highest value as a fertilizer. Another form of the same material is used as a disinfecting absorbent for purifying the air of closets and stables, and when filled is mixed with earth and sand and used as manure. It is the best material known for protecting trees and plants from frost in winter. Walls filled or padded with peat are rendered warm and dry, and beds made of it are clean, dry and sanitary, so that it is extensively used in hospitals and asylums.

Then the peat fiber is compressed and hardened by a special process into sheets, tiles, plates and blocks for various building purposes. It is used for lining walls, ceilings, window and door frames, to underlay wooden flooring, and even as flooring itself. It has about the consistency and atomic weight of sound cork, and being an almost perfect non-conductor of heat, moisture, sound and vibration, it is of great value in locations where warmth, dryness and protection from noise or jar are especially desired in dwellings. It is impregnated with some material which renders it practically incombustible, so that the building inspectors abroad approve it, and even recommend its use. It is one of the cheapest of all building materials, is light to transport, clean and easy to handle, can be painted, nailed or glued together, and from a sanitary standpoint is a nearly ideal building material. A floor of this peat fiber, covered with a rug or carpet, is said to offer the luxuries of warmth, stillness and comfort in a modern dwelling.

Pasteboard, too, can be made of 40 percent peat and 60 percent wood shavings, and it is said to be far superior to the ordinary quality of pasteboard, as it is stronger, lighter and cheaper.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,
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Harrow..... H. V. & N. W. Abbott

Harvester and binder shocker attachment. Grain..... J. Ostrum
Harvester buncher. Pea..... D. Tolton et al
Harvester. Corn..... J. J. Wagoner
Harvesting device. Beet..... G. R. Dotson
Harvesting machine. Beet J. L. & M. H. Webb
Hasp fastener..... C. L. Bailey
Hat frame machine..... A. Kindermann
Hay rake. Horse..... E. D. Bond
Heating. Electric..... S. S. Eveland
Hoisting apparatus..... V. R. Browning
Hoisting system. Electric..... J. D. Ihlder et al
Horse detacher..... J. E. Nilsson
Hose. Metallic..... E. T. Greenfield
Hose reel..... L. A. Grimsrud
Hot air furnace..... H. P. Fish
Hot air heater..... J. E. Albinson
Hydrant or fire plug..... C. E. Cotton
Incubator heating system..... J. V. Lindsey
Indicating mechanism..... J. H. Forsythe
Indicator..... C. Versteeg
Inhaler..... G. A. Thiede
Insect trap..... C. W. Pelton
Insulating clamp..... T. B. Lee
Insulating material for electrical purposes. Production of..... J. Meyenberg
Insulator pin and support therefor..... L. Steinberger
Internal combustion engine..... F. A. Haselwander
Jack..... W. Umstead
Jointer's clamp..... A. Kruger
Key fastener..... A. A. Svensen
Keyboard for type-writing machines and pianofortes..... J. H. Laudenbach
Ladder. Folding..... P. A. M. Lanier
Ladder. Gymnasium..... F. Medart
Ladder. Step..... M. E. Trafton
Ladder. Store..... W. Fickett
Lamp. Acetylene generating..... E. Waechter
Lamp. Convertible gas and oil..... M. S. Thorud
Lamp jack..... F. Conrath
Lamp suspension device. Electric C. Smart
Lantern. Foot actuated..... F. C. Lyon
Latch..... H. Tsvinger
Latch. Door..... C. Hseemann
Lathe tool holder..... R. E. Colton
Leather and making same..... L. Feval
Leather finishing composition and making the same..... W. W. Crooker
Leaves. Treatment of..... G. R. McGahan
Lenses. Manufacturing bifocal J. Wimmer
Lever operating mechanism. Vibrating..... L. Oserdonk
Lifter and carrier..... W. F. Peeler
Lifting jack..... A. E. Schocke
Lifting jack..... E. C. Yeager
Lightning arrester..... J. H. Pearson
Lime hydrating machine..... P. C. Forrester
Linotype machine..... 3 pats..... D. S. Kennedy
Linotype machine..... R. M. Bedell
Linotype machine..... R. G. Clark
Lister, planter, and roller. Combined..... M. Brown
Loading frame..... W. Lichte
Loading manure, earth, gravel, &c. Device for..... J. C. S. & H. R. Rumsey
Locomotive buffer beam..... J. B. Barnes
Locomotive tender and tank car frame..... C. H. Howard
Locomotives, &c. Apparatus for holding connecting rod braces for..... M. & H. E. Morton
Locomotives, &c. Shaper for crowning and finishing driving boxes on..... M. & H. E. Morton
Logotype machine..... D. Petri-Palmedo
Loom shuttle box..... J. Blm
Lubricating device..... W. Scott
Lubricating system..... G. Crowell
Lubricators. Means for filling..... E. C. Jordan
Machine recorder. Automatic..... R. A. Wood
Mail assorting table..... C. A. Kendall
Mail bag catcher..... G. H. Nichols
Mail transportation system..... E. S. Uoright
Manicuring tool..... C. Bailey
Manifolding pad and holder..... W. F. Beck
Marking gage for rules..... C. Nielsen
Mattress..... M. Brown
Measuring wheel. Tailor's..... E. G. Agnell
Medical apparatus. Electric..... C. Van Bergh
Merry-go-round and teeter. Combination..... I. W. Arney
Metal working apparatus..... J. R. Blakeslee, Jr
Metal working tools. Manufacturing..... H. H. Dierig
Metals. Production of homogeneous bodies from tantalum or other..... M. von Pirani
Middlings purifier..... G. T. Smith
Milling machine..... W. Schenk
Mold for sash weights, &c..... W. S. Myers
Molten or semimolten materials by means of electricity. Maintaining or increasing the fluidity of..... F. Wynne
Motors and generators. Brush holder for..... J. Lindall
Mower. Lawn..... A. Hill
Multiply fabric..... G. D. Moore
Music leaf turner..... F. W. McNeil
Nail polisher..... E. L. Buzzell
Nail puller..... A. P. Snyder
Nest. Hen's..... J. H. Blank
Nut lock..... A. Baker
Nut lock..... J. G. Weninger
Nut lock..... J. Jacoby
Nut lock..... C. S. Wilson
Nut lock..... M. Ellis et al
Nut wrench. Magazine socket..... A. L. McMurtry
Oil burner..... C. N. Moore
Oil burner..... A. J. Blackford
Oil cake trimmer..... J. D. Belanger
Oil or gas engine..... E. Thomson
Oysters. Shucking..... E. L. Torsch et al
Packing. Piston rod..... E. G. Bostwick
Pallet setting implement..... J. B. Rouchard
Pen. Self-filling fountain..... M. Z. Fuller
Pencil..... A. Henniger
Pencil..... J. C. Baur
Photographic plate holder..... A. C. Hayden
Piano. Automatic..... 2 pats..... R. A. Rodesch
Piano players. Pedal action for..... C. G. Hermanson
Piano playing attachment..... A. Wilhelmj
Pile core..... A. A. Raymond
Pile driver..... H. Gee
Pile driving machine..... H. Gee
Piling. Metal sheet..... 3 pats..... J. R. Wemlinger
Pipe coupling..... E. J. Robbins

Pincushion and spool holder. Combined..... L. Thompson
Pipe joint. Elbow..... W. B. Campbell
Pipe joint. Universal..... R. Enright
Pipe mending device..... G. Stuppar
Pipe stopper or test plug..... A. Redenbaugh
Plane. Multiple beading..... P. Harding
Planer tool holder. Reversible duplex..... E. Pierce
Planer ways. Protector for..... W. A. Thelin
Planter. Seed..... S. R. & T. E. Sikes
Plow..... J. McMullin
Plowshare..... E. B. Murphy
Plug. Safety..... 2 pats..... B. W. Robinson
Pneumatic engine..... E. Leichter
Postmarking and canceling machine..... N. A. Krag et al
Potato digger..... E. B. Church
Power. Generating..... A. B. Goodspeed et al
Power transmission device..... L. Fritschka et al
Power transmission. Swing..... A. M. Starr
Press for moist materials..... J. Hemmerling
Printers' chases. Adjustable cross bar for..... J. E. Gilbert
Printing machine..... 2 pats..... H. Stamm
Printing press..... F. A. Vennev
Printing press form bed..... F. J. Herdle
Propulsion. Boat..... H. E. Grace
Pulling up rods, piles, pickets, and the like from the ground. Apparatus for J. Richter
Pulp. Production of white..... A. Gagedols
Pulverizer..... N. Saurgin
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Puzzle..... J. F. Toomey
Quilting frame..... S. C. Baughn
Rail joint..... F. F. Martins
Rail joint..... B. G. Buchanan
Rail joint..... G. J. Richardson
Rail tie and fastener therefor. Metallic..... J. W. Calder
Railway crossing signal..... J. Crumley
Railway rail joint..... J. J. Feeny
Railway switch stand and switch lock..... J. R. Wyatt
Railway tie..... P. D. Nicols
Railway track joints. Graduated reinforced arched angle bar for..... reissue..... G. H. Williams
Railway. Underground electric..... S. M. Sullivan
Range..... R. S. Quinn
Range finder..... H. C. Percy
Reach coupling..... A. L. & J. C. Kirkpatrick
Reamer..... J. G. Matthews
Recording instrument..... C. E. Vawter, Jr
Refrigerator tub or bucket..... J. D. Collins
Registering device..... A. C. McEwen
Rendering tanks into the atmosphere. Means for preventing the escape of noxious vapors and gases from..... C. L. Smith
Rivet displacing device..... J. Kitterman
Road smoothing device. Wagon..... F. W. Lechner
Rolling mill..... W. H. Brown
Rolling mill repeater controler..... F. P. Townsend
Rolling mill work reversing mechanism..... E. Norton
Rolling. Preparing rolls for..... A. Ridd
Rotary engine..... G. F. Burton
Roundabout or carousel..... J. M. Taylor
Ruling device..... C. C. Glidden
Sash bar. Metal..... F. H. Treftz
Sash lock. Swing..... M. Petrovics
Saw guide..... A. Harrold
Sawing devices. Adjustable platform for tree..... H. Funk
Sawing machine. Adjustable..... C. Thomas, Sr
Sawing machines. Oblique feeding attachment for..... J. B. Carr et al
Scenery..... J. M. Leavitt
Scraper and dump wagon. Combined shovel..... C. F. Thomas et al
Screw..... F. W. Braunschweig
Scribing device..... M. Morton et al
Seal. Self locking..... W. F. Harris
Seaming together the edges of sheet metal sections. Machine for..... A. G. Scherer
Seed hulling apparatus. Cotton..... C. Miner
Seed lifters. Delinting cotton..... C. H. Casebolt
Severing apparatus..... G. P. Hemstreet
Sewage disposal apparatus..... B. J. Ashley
Sewing machine embroidery attachment..... C. E. Reardon
Sewing machine thread guard and spool holder..... S. L. Lyon
Sewing machine trimmer..... A. H. Parker
Shade bracket and curtain rod support. Combined..... C. H. Nelson
Shade fastener. Window..... G. E. Johnston
Shade roller attachment..... W. B. Reynolds et al
Shade roller. Window..... E. S. Dinkel
Sheet winder..... H. K. Sandell
Shell winding machine..... G. H. Poor
Sifter. Ash..... P. M. Stanton
Sifter. Toilet powder..... F. S. Dilworth
Sign..... H. Christensen
Sign. Street display..... J. Kraus
Signaling device..... R. H. McCrackin
Silk reclaiming machine..... F. W. Midgley
Silk. Ungumming..... P. Schmid
Silo..... W. H. Limberg
Silo..... W. M. Phillips
Siphon..... J. F. Harrigan
Skirt supporter..... L. B. Shelton
Skirts. Bustle attachment for..... W. P. Jorde
Sled. Manually propelled..... F. T. Nobles
Smoke consumer..... W. Pinney
Smoking pipe..... A. Vogelsang
Smoking pipe..... A. G. Abizaid
Snap hook..... A. Madler et al
Snap hook..... I. H. Read
Soap. Molding..... G. Klinger
Soles and heels for boots and shoes. Tool for trimming the edges of..... Z. Beaudry
Sounding. Sea..... A. F. Ellis
Speed changing mechanism..... L. Renault
Speed indicator and recorder..... H. Soar
Speed mechanism. Variable..... C. M. Spencer
Speed regulating mechanism..... G. F. Leiger
Splice bar..... E. McCormick
Spool holder..... W. Green
Sprinkler head. Automatic..... J. A. Cass
Square attachment..... W. F. Rowell
Stacker. Wind..... R. R. Howell
Stair rod..... P. J. A. Smith
Stamps. Inking pad for rubber and other..... F. A. Sommer

Station indicator..... W. P. Ennis
Steam generating power plants. Apparatus for increasing the efficiency of..... A. B. Goodspeed et al
Steam generator..... W. Mitchell
Steam generator coil..... H. D. Langton
Steam trap..... J. E. L. Ogden
Steering wheel for automobiles..... W. F. Towne
Stencils. Making..... A. D. Klaber
Stop mechanism. Emergency..... H. R. Tooker
Storage bin..... J. H. Trompauhauser
Stove. Foraminous ledge..... P. J. Mooney
Stovepipe..... M. A. Flannery
Street and station indicator..... O. E. Kellum
Straw cutter..... D. A. J. F. & R. C. Stewart
Street sweeper..... A. R. Monette
Strength testing machine..... W. H. Lehman
Stretcher. Folding..... W. Utzinger
Surgical table top..... M. I. Young
Sweeper..... J. B. Scovell
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Switch point lock..... W. I. Kaiser et al
Switch points and signals. System for operating..... A. Descubes
Switching device..... J. A. Birsfield
Target. Registering..... J. N. Michal
Telegraphy..... J. C. Barclay
Telephone booth..... B. F. Merritt
Telephone detector..... A. R. Plehn
Telephone receiver. Modulating..... K. M. Turner
Telephone toll line system..... W. W. Dean
Telephone toll lines. Apparatus for..... T. R. Laing
Temperature regulator. Automatic..... F. A. Beckwith
Terminal base. Interlocking..... L. Steinberger
Theodolite or similar instrument..... C. P. E. Schneider et al
Thermometer. Clinical..... W. P. Grafton
Thill Shifting..... J. Triestram
Thimble..... E. Barnett
Thin leaf or fabric..... H. R. Gregory
Threading tool..... T. W. Nurse
Threshing machine feeder. Portable..... D. Still
Tile or slab. Reinforced..... C. C. Davis
Tiles provided with flanged edges. Apparatus for forming..... A. Weill
Tilting gate..... J. A. Schertz
Timber framing machine..... J. Douli
Time recorders, &c. Ribbon mechanism for..... J. & A. Dey
Tire protector..... C. E. Kimball
Tire shrinking machine attachment. Cold..... S. N. House
Tobacco pouch..... B. J. Head
Toothpick machine..... W. W. Tainter et al
Trace fastener..... A. W. Frye et al
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Trolley wire sleeve..... C. W. Kettman
Truck bolster..... W. F. Richards
Truck for baggage, &c..... B. L. Westervelt
Truck lock. Railway..... C. Maarkant
Trunking device and selective signaling apparatus. Automatic..... A. A. Monson
Tube mill blank support..... G. H. Blaxter
Tubular fabric and making the same..... G. D. Moore
Tunneling machine..... J. P. Karus
Tunnels under water. Device for constructing..... I. T. McComas
Turbine. Elastic fluid..... J. G. Callan et al
Turbine. Elastic fluid..... 2 pats..... D. Nishizaki
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Turbine governing mechanism..... W. L. R. Emmet
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Turbine motor..... W. A. Warmar
Turbine motor and muffler. Combination..... W. Ruff
Turbine regulator..... D. Nishizaki
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Type writing machine..... J. C. McLanahan
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Valve and valve seat for steam traps..... J. E. L. Ogden
Valve. Double..... J. C. Kitton
Valve for engines. Balanced..... J. M. Cosper
Valve. Gate..... L. D. Casper
Valve mechanism for rotary engines..... W. R. Dawe
Valve. Pop safety..... J. Porteous
Valve. Vacuum cylinder drain..... F. Weiss
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Valves. Controlling means for release..... S. C. Moore
Valves. Machine for setting locomotive..... J. J. Conolly et al
Vault cover mold..... J. H. Denney
Vehicle fender..... L. A. Frayer et al
Vehicle. Motor driven..... I. W. Schmidt et al
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Vehicle running gear..... J. W. Bentley
Vehicle stake..... G. L. Harvey
Vehicle tops. Removable bottom frame for..... C. Silcott
Vehicle wheel..... W. S. Hadley
Vending machine..... C. Forth
Ventilator..... W. D. Robinson
Ventilator..... A. Kousalik
Vessels. Means for effecting escape of occupants from sunken..... I. Fripp
Vessels. Means for retarding the movements of..... J. Englund
Vine and weed cutter..... C. F. Hippard
Wagon brake. Automatic..... H. A. Kennard
Wagon. Dump..... 2 pats..... D. S. Watson
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Washing machine..... R. Woerner
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Watchcase..... G. A. Schlechter
Watches in the cases. Means for fastening the movements of..... E. J. Martel
Watchmaker's tool..... D. Dekle
Water closet flushing tank..... L. Lipp

Hog trough.....	G. Strahle
Hoisting apparatus.....	2 pats. L. Moss
Hook and eye.....	M. J. Rattigan
Hoop making machine.....	L. D. Scott
Horse protector.....	J. E. Crawford
Horseshoe.....	J. D. Olcott
Horseshoe attachment.....	J. W. Buck
Hose.....	W. W. Spadone
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Hot air furnace.....	W. S. Turney
Hot air register.....	C. H. Meibeyer
Hub, Wheel.....	C. Therrien, Sr
Hydraulic jack.....	H. C. Dudgeon
Hydrocarbon burner.....	L. Uhrig et al
Ice scraper.....	J. Drees
Icing machine.....	A. W. Copland
Incubator and brooder, Combination.....	V. Hartnett
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 W. C. Giegler
 Linotype machine J. R. Rogers
 Liquid cooling apparatus..... L. A. Anson
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 Liquid meter W. Thomson et al
 Locking device. Adjustable..... W. S. Atwood
 Loom J. Rigby
 Loom beating up mechanism..... C. W. Bates
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 A. E. Benson
 Loom shuttle. Self-threading
 J. B. Daudelin
 Loom shuttle Self-threading P. P. Daudelin
 Loom stopping and starting mechanism.....
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 C. F. Rorer
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 C. Ortmann
 Match holder and lighter..... V. Wirquist
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Mechanical movement F. H. Richards
Melting pot feeding device..... E. Trama
Metal cutting machine S. H. Lewis
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Metals from their ores. Apparatus for extract-
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..... W. H. Coe
Mine door. W. W. Zuber
Mirror. Adjustable E. L. Bell
Mirror and lamp. Combined mouth ...
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Moistening color ribbons. Device for ...
..... F. A. Langen
Mold G. L. Bartlett
Monkey wrench..... D. Gobel
Mop head and wringer. Combined
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Motor..... R. R. Spears
Motor control system..... C. Schiebeler
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Music leaf turner..... J. B. Golden
Musical roll support. Detachable... E. S. Votey
Musical instrument. Valved wind... C. G. Conn
Musical instruments. Air governor for... ..
..... J. H. Chase
Necklace. Pearl..... B. Roede
Necktie fastener..... E. E. R. Drescher
Nozzle. Spray..... A. B. Hull
Nut retainer..... M. V. Golden
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Ore crushing and screening mill... J. Algert
Organ..... R. Hope-Jones
Orientation device..... H. C. Lomb et al
Osteopathic table..... H. T. Root
Outlet box..... F. W. Erickson
Oven..... J. J. Murphy
Overalls..... L. Rutenbeck
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Packing case..... W. P. Fitzgerald
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Pan guard or extension. Baking M. B. Smith
 Pane attaching means..... R. C. Fingal et al
 Paper box making machine..... E. Jagenberg
 Paper clip C. R. Mueller
 Paper. Loading or filling substance for use in
 the manufacture of..... A. Monin
 Paper shells. Machine for making.....
 A. A. Raymond
 Paper surface finishing machine L. M. Yoerg
 Partition. Reinforced..... M. W. Lauer
 Pen. Fountain..... J. S. Barnes
 Pen. Fountain..... F. W. Erickson
 Penny collector H. G. Hewitt
 Perforated strips or sheets. Apparatus for
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 Perforator H. Upton
 Photograph C. Ridderhof
 Photograph W. W. Rosenfield
 Photograph plate..... P. V. W. Welsh
 Photographic film cartridges. Spool for.....
 F. J. Mathein
 Photographic print testing device..... F. Sohon
 Photographic printing apparatus F. H. Auld
 Photometer. Integrating..... C. P. Steinmetz

Piano action.....	L. N. Soper
Pianoforte.....	G. Biess
Picking block.....	M. J. Murray
Pipe bracket.....	H. Wyler
Pipe coupling.....	W. Bartholomew
Pipe hanger, Adjustable.....	C. H. Hook
Pipe testing machine.....	J. P. Mern
Pliers, punch, and similar tool.....	W. A. Bernard
Plow.....	W. P. Hendon

Plow attachment C. A. Phillips
 Plow blade Cultivating A. R. Sullivan
 Plow Disk C. C. Leuty
 Plow stock A. R. Mallory
 Plug and wall receptacle. Attaching J. J. Hartley et al
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 Pocket. Safety watch G. W. Robertson
 Policeman's club C. J. Diehl et al
 Post card frame or mount E. E. Fairchild
 Power transmission device C. A. Taylor
 Power transmission device A. Churchward
 Printers' galleys. Galley lock for H. L. Adzitt
 Printing and embossing apparatus E. E. Angell
 Printing plates. Preparing half tone L. Kern
 Projectile E. Ohl
 Projectile. Anchor E. S. Clough
 Propeller J. A. Wade
 Propeller A. Hector
 Propelling and floating device for boats and the like H. Mikorey
 Propelling mechanism. Boat H. Thormeyer
 Pulley casing R. H. Bowen
 Pulley frame L. Zamboni
 Pump J. H. Burkholder
 Pump C. Vanquette
 Pump. Lift F. A. Ruhl
 Pump. Multiple J. F. Liebenritt
 Pumping jack E. Shauan
 Puzzle C. C. Hayhurst
 Pyrimidin derivative L. Weber
 Rail bond W. E. Foster
 Rail joint W. A. Hanvey
 Railway alarm C. J. Courtright
 Rail way crossing signal D. J. Brush
 Rail way gate G. E. Murray
 Railway signaling system. Electric J. B. Struble
 Railway switch E. F. Greene
 Railway switch. Overhead E. C. Newton
 Railway tie F. Bryer
 Railway tie. Composite L. H. Wolff
 Rake U. S. Jessup
 Rake R. H. Whitted
 Recorder D. Patterson
 Reel carrier J. J. Tellington
 Reel seat F. C. Gorham
 Relay structure H. G. Webster
 Resistance devices. Making L. E. Birringer
 Rings, &c. Flaring machine for metal G. H. White
 Rock and ore crusher G. H. Thurston
 Rock drill F. E. Glaze
 Rod catcher M. Krepp
 Roll forming machine. P. P. Nungesser et al
 Rolling machine. Hoe F. W. Cameron
 Rope clamp C. W. Gutzzeit
 Rotary drier H. Brinkner
 Rotary engine D. F. Smith
 Rotary engine J. Burn
 Rotary explosion engine L. W. Lombard
 Rotary motor C. S. Batdorf
 Rubber footwear. Making M. C. Clark
 Rugs, carpets, &c. Material for F. Bartelt
 Sad iron F. A. Hoya
 Safe. Round door M. Mosler
 Safety elevator A. Bennett et al
 Safety pin R. Douglas
 Sash adjuster J. W. Paterson
 Sash lock and support D. E. Barnes
 Sash lock. Ventilating window F. E. Jeffers
 Saw tooth L. G. McKam
 Scale Spring M. H. Hansen
 Scenery. Theatrical E. S. Cameron
 Scraper. Wheeled J. S. Norris
 Screen F. Mikesell, Jr
 Screw R. S. Matheson
 Seal L. A. Brown
 Sealing apparatus. Package J. H. Tuttle
 Sealing apparatus. Package C. B. Frost
 Sealing device. Package C. B. Frost
 Seeding machine L. E. Waterman
 Self locking block and pulley G. M. Jensen
 Sewing machine seam trimmer and edge blinder W. R. Abercrombie
 Sewing machine thread controlling and unwinding device J. H. La Bate
 Sewing machines in wagons. Device for fastening F. M. Sargent
 Shade and curtain pole holder. Window J. H. Green
 Shade. Double acting window M. Ecker
 Shade fixture. Window S. R. Skov
 Shade holding device C. L. Hopkins
 Shade roller A. L. Sutton
 Shaft reversing device A. Sundberg et al
 Shampoo registering device H. C. Kelley
 Sharpener. Shears W. G. Wilson
 Sheep shears M. A. Lipscomb
 Shipping case N. J. Busby
 Shirt waist M. Frerkson
 Shock absorber W. Mazzocco
 Shuttle spindle W. Koehler
 Sidewalk light E. A. Reich
 Sight C. & M. A. S. White
 Sign. Electric W. B. Garrett
 Sign exhibitor. Automatic F. A. Johnson et al
 Signal system. Electric W. M. Thomas
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 Signa log. Electric. 3 pats J. B. Struble
 Signaling instruments. Casing for electric E. W. Vogel
 Signaling system. Fire and police W. Condon
 Sink, bath, and wash tub. Combined W. J. Minns
 Siphon W. S. Shields
 Skirt marker W. H. Simmons
 Sled G. Koch
 Sled runner F. Bryer
 Soldering sheet metal plates J. Donoghue
 Sole. Cushion H. A. Roberts
 Sole leveling machine E. E. Winkley
 Speculum. Illuminable R. H. Wappler
 Speed mechanism. Variable A. W. Pupke
 Speed mechanism. Variable F. A. Weller
 Spring wheel I. Fliegel
 Stacker. Hay A. F. Kearns
 Stamp. Automatic identification J. T. Earle
 Stationion F. S. Overacker
 Steam boiler E. A. Johns
 Steamer. Domestic S. M. Johns
 Stenciling machine S. T. Smith, Jr

Stocking supporting means... G. F. Mansfield
 Stoker. Mechanical F. J. Crollis
 Stokers. Coal magazine for automatic L. D. Smith
 Stone polishing wheel S. H. Mills
 Stove attachment. Gas heating V. W. Blanchard
 Stove. Gas burning... 2 pats V. W. Blanchard
 Stove. Gas cooking V. W. Blanchard
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 Stove lining clamp and support... S. Weinberg
 Stove or range. Gas cooking V. W. Blanchard
 Stovepipe drum J. J. Roberts
 Street indicator for electric railways. Automatic E. M. Smith et al
 Striker plate J. H. Shaw
 Stringed instruments. Playing mechanism for L. A. Kampelman
 Stroke varying mechanism C. H. Baldwin
 Subway ventilating system W. E. Lamb
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 Superheater F. J. Cole
 Suspending and hoisting mechanism O. Hetlesæter
 Switch apparatus. Prepayment time E. Schattner
 Switch operating apparatus. Electric I. L. Van Buskirk
 Switching device E. F. Gehrken
 Synchronism indicator P. J. Clark
 Table leg connection J. L. & D. Q. Nevin
 Tablet. Writing paper L. R. Nelson
 Tackling machine horn support O. Kraus
 Tank cut off Oil A. L. Stump
 Tank inspector and gage. Tubular W. Gregson
 Tank shut off. Oil I. B. Carr
 Target attachment H. B. Hollifield
 Teeth. Reinforce and backing for artificial I. Stern
 Telegraphy I. Kitsee
 Telegraphy W. P. Phillips
 Telephone disk stand and call bell. Combined C. A. L'Hommedieu
 Telephone exchanges. Signaling system for... F. R. McBerly
 Telephone system C. A. Wardner
 Telephone systems. Trunk circuit for J. B. Kelley et al
 Telephone trunking system W. Dean
 Tension device S. W. Wardwell
 Theaters. Turning stage for M. Kahane
 Threshing machine. Transit D. M. Hartsough
 Tile molding machine D. Leonard
 Tiles. Machine for laying underground drain M. P. McCulloch
 Till. Check C. Blankenagel
 Tire. Pneumatic L. N. Cates
 Tire. Resilient vehicle F. Morris
 Tire. Vehicle J. E. Hopkinson
 Toothpick holder C. H. Sharp
 Torch. Blow F. G. & H. R. Emmelmann
 Torpedo placing device for railways. Automatic W. H. Kelley
 Toy W. Stevens
 Toy lantern J. C. Tyndall
 Transformer. Electric J. Murgas
 Transmission lines. Protection of parallel... A. Fiare
 Transmission mechanism G. S. Comstock
 Trap H. J. Houtsinger et al
 Trolley bracket. Center stop... J. H. Cook
 Trolley track switch. Overhead F. Kramer
 Trolley wheel E. P. Sharp
 Trolley wheel G. B. Nussbaum
 Truck E. C. Bruen
 Truck A. P. Sands
 Truck A. Schafer et al
 Truck. Car W. P. Bettendorf
 Truck. Swing motion W. P. Bettendorf
 Trunk. Wardrobe W. C. Likly et al
 Turret tool post G. E. Greenleaf
 Twine holder G. Hanscom
 Type. Apparatus for exactly printing or impressing F. A. Langen
 Type in type galleys. Clamping R. W. Goeb
 Type writer cabinet F. W. Tobey
 Type writer carriage E. B. Cram
 Type writer operator B. F. Hatches, Jr
 Type writer ribbon mechanism A. Schneeloch
 Type writers. Automatic paper feeder for... B. F. Hatches, Jr
 Type writing machine W. F. Helmond
 Type writing machine H. S. McCormack
 Type writing machine 2 pats. F. X. Wagner
 Type writing machine H. L. Wagner
 Type writing machine H. S. McCormack
 Type writing machine F. X. Wagner
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 Type writing machine 2 pats. J. J. Hannahs et al
 Universal joint for shafts and rods A. J. Hughes
 Valve. Air inlet P. H. Reardon
 Valve. Automatic A. F. Priest
 Valve. Double seated J. E. Purser
 Valve for automobile engines. Auxiliary F. T. Cab'e
 Valve. Hot water J. L. Cook
 Valve. Single seated J. E. Purser
 Valve. Whistle L. Krazenstein
 Vault light J. M. Gwinn et al
 Vehicle body spring support L. N. Stewart
 Vehicle brake B. P. Lukens et al
 Vehicle spring M. Emmerich
 Vehicle storm front H. D. Pursell
 Vehicle wheel T. Jones
 Vehicle wheel C. A. Gauld
 Vehicle wheel A. A. Ambler
 Vehicle wind shield G. Huillier
 Ventilating apparatus J. G. Garner
 Ventilation and heating. System of... R. W. Shaw
 Vise. Carpenter's floor R. Marz et al
 Vise. Compound J. H. Westcott
 Voting machine W. J. Lausterer
 Voting machine A. J. Gillespie
 Wafer lifting device Y. Kawasaki
 Wagon brake G. F. Young
 Wagon. Dumping R. Critser et al
 Wagon. Dumping J. Heberling
 Waist holder and skirt supporter. Combined J. Elsmann
 Wall forming mold W. D. Ham
 Walls and other surfaces. Decorating... E. Switzer
 Washing machine H. E. Thompson
 Washing machine P. Werts

Washing machine. Cylinder W. Bartholomew
 Watch N. Currie
 Watches. Antimagnetic device for A. T. Wall et al
 Water closets, lavatories, &c. Flushing apparatus for M. Mendoza
 Water heater and still. Combined... D. W. Daley et al
 Water heating apparatus V. W. Blanchard
 Water motor L. M. Shaw
 Water regulator W. A. Carson
 Water wheel G. D. Gilbert
 Wave meter J. Murgas
 Weather guard E. L. Charroin
 Weather strip S. P. Bricker
 Weighing machine. Automatic... G. Hoepner
 Weighing machine. Grain B. M. Steele
 Weighing machine. Grain M. Davis
 Well cap T. A. Cooperrider
 Well drilling machine J. W. Scherer
 Wells. Method of and apparatus for sinking E. F. Bradt
 Wetting up W. C. Geger
 Wheel F. H. Bowen
 Wheel J. E. Zimmerman
 Wheel attachment. Vehicle D. Ward
 Wheels. Making C. T. Schoen
 Whiffletree hook O. R. Haga
 Whip socket W. F. Farber et al
 Wick tube W. R. Jeavons
 Windmill 2 pats. E. P. Bergman
 Window reissue. S. U. Barr
 Window cleaning device R. J. Clarke
 Window. Teller's. 2 pats. E. Liberty
 Wire stretcher H. S. & M. D. Harris
 Wire stretcher and fastener. Combined... E. P. Moore
 Wood covering or facing H. Romander
 Wood grooving machine R. S. Allan
 Wrench T. H. Lavier
 Wrench S. P. Schneider
 Yoke. Safety neck H. T. Hooker

DESIGNS.

Badge A. H. Kopetschny
 Bottle N. L. O'Neill et al
 Fabric. Pile. 2 pats. F. E. Kip
 Lamp stand R. Murr
 Picture frame S. Bilek
 Puzzle box E. W. Wright
 Ribbon G. A. Morgan
 Vessel for table use. 2 pats. A. Paroutaud
 Watch fob J. H. Hall, Jr

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Abdominal guard and supporter... J. Gamble
 Acids. Bromin derivative of fatty... E. Fischer
 Adding machine G. N. Hinchman
 Adjustable wrench G. E. Woodbury
 Advertising device C. M. O'Brien
 Agitator B. Soils
 Agricultural implement H. C. Weaver
 Air brake mechanism C. G. Lundholm
 Air filter and cooler L. F. Pawley
 Alloy A. H. Smith
 Amusement device P. Boyton
 Anchor post and stretcher F. Underwood
 Anti pig rooting device T. W. Box
 Auger. Packing E. E. Ziegenfuss
 Automatic coupling P. Lamche
 Automatic sprinkler W. S. Thurlow et al
 Automatic top holder C. W. Coops
 Automobiles. Antislipping device for... E. Nye et al
 Automobiles. Differential clutch mechanism for... F. W. Hedgeland
 Axle G. A. Weaver
 Axle construction. Front G. E. Babcock
 Back spacing mechanism W. W. Torrence
 Bait. Artificial B. F. Burke
 Bait. Artificial fish E. C. Adams
 Baling press J. A. Carney
 Baling press H. L. Whitman
 Baling press J. A. Spencer
 Ball back stop. Base W. S. Titus
 Ball marker. Golf J. C. Cory
 Balls. Making playing F. H. Richards
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 Barrel and box carrier J. A. Wright
 Barrel cover or lid support... W. J. Madole et al
 Basket. Fruit picker's F. Cartmel
 Basket handle J. B. Kenny
 Beam G. B. & G. D. McLean
 Bearing. Colter T. R. Wallis
 Bearing. Roller A. J. Morse
 Bed bottom. Spring J. Reilly
 Bed. Folding S. E. Twitchell
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 Bed rail joint. Iron W. L. Fredericks
 Bed. Spring I. H. Haas
 Bedclothes holder L. E. Henry
 Bedstead. Couch J. H. Dyett
 Belt. Conveyor E. A. Houchin et al
 Benzin, &c. Apparatus for recovering... A. E. Vincent
 Beverage making device D. S. Holley
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 Binder. Loose leaf H. G. Buchan
 Binder. Temporary E. G. Dow
 Block making apparatus. Molded J. O. Winston
 Boat U. R. Miller
 Bobbin holder A. E. Rhoades
 Boiler tube scraping apparatus... A. G. Hay
 Roring machine F. H. French
 Bottle F. Hayden
 Bottle C. E. Justison
 Bottle F. Smith
 Bottle closure J. B. Short
 Bottle closure A. E. Batchelder
 Bottle. Electrically heated hot water... H. W. Christian
 Bottle filling machine S. M. Healings
 Bottle stopper or cork extractor... J. B. Short
 Box T. G. Palmer
 Box handle N. L. Barmore
 Bracelet I. M. Syvester
 Bracket H. T. Holland
 Brake shoe C. W. Booth
 Branding machine. Sheep... J. A. Magelassen
 Brick handling implement. Hollow C. S. Hall
 Brick mold F. Mueller
 Broiler J. W. Ross

Broom corn saw machine A. J. Middleton
 Bucket for dredging purposes. Scoop C Pay
 Buckle and cockeye for harness traces. Combination E. B. Knapp
 Buckle attachment for straps J. Van Cleave
 Buckle. Crossline F. W. T. Mitchell
 Building block S. T. Playford
 Building block for chimneys... E. C. Newell
 Building purposes. Anchorage for R. P. Smith
 Buoy W. C. Beebe
 Buoy. Life saving W. F. Clark
 Burner B. A. Baxter
 Button A. J. Levy
 Button cutting and sawing machine. Automatic J. W. Miller
 Buttons, brooches, belt clasps and buckle fronts from horn and hoof. Manufacture of F. H. Grove
 Cables. Steel supporting structure for electric transmission A. K. Mansfield
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 Camera stand K. Nelson
 Can cover fastener. reissue. C. E. Berrie's
 Can opener A. G. Snowdon
 Can top. Powder J. H. Goss
 Canopy frame I. E. Palmer
 Canopy. Ventilating W. L. Hofer
 Cant book or peavey P. Price
 Car. Ballast C. A. Proctor et al
 Car construction. 2 pats. F. M. Brinkerhoff
 Car construction. Passenger F. M. Brinkerhoff
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 Car cover. Railway G. A. Helmhuber
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 Car draft rigging. Railway W. Slayden
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 Car friction spring draft rigging. Railway... J. F. O'Connor
 Car mover M. N. Shell
 Car. Railway D. L. Miner
 Car replacer C. H. Hess
 Car roller side bearing. Railway F. B. Townsend
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 Car roof frame. Box W. H. Emerick et al
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 Car step L. Yeager, Jr
 Car step. Extension K. Stevens
 Carburer P. Gaeth
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 Card sorting device D. Kent
 Carpet stretcher C. Helm
 Cash checking machine E. Guess
 Cash register E. Van Camp
 Casket handle W. T. Fisk
 Caster W. Imbt
 Catamerial bandage M. A. Cook
 Cement block machine J. W. Herring
 Cement for resisting water. Impermeable... G. Frolo
 Cement kiln J. S. Wentz
 Cement post W. E. Varney
 Cement post mold W. E. Varney
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 Chair head rest. Barber's... B. F. Buchanan
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 Chock J. M. Thomas
 Churn and butter worker... G. J. Kaplan
 Cipher code. Telegraph and cable... F. W. Lietzow
 Circuit changing mechanism... H. G. Webster
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 Clamp J. B. Danforth
 Clamping ring J. Clark
 Cleaning apparatus A. E. Sadler
 Cleat. Wire J. W. Steele
 Cleaver and meat tenderer. Combined... F. White
 Clothes line fastener L. C. A. Denlea
 Clothes line support J. H. Ruehmeling
 Clothes line support and holder L. Windt et al
 Clutch A. J. Morse
 Clutch J. C. Potter et al
 Coaches. Skirt guard for baby M. L. Fiske et al
 Cocks. Pressure regulator for gas M. W. Longfellow
 Coffee pot C. M. Overcash
 Coin operated mechanism. 2 pats. J. J. Wood
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 Concrete ceilings. Hanger support for... A. J. Perkins
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 Concrete form J. M. Carmody
 Concrete mixer E. E. Flora
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 Condenser. Surface... C. N. Tatarnicoff
 Conduit box C. A. Hindsdill
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 Connecting rod head W. W. Sleeman
 Convertible table F. A. Richter
 Conveyor. Cross C. Bradford
 Conveying apparatus F. H. Wollever
 Cooker A. Major
 Cooker A. K. Schulte
 Cooling apparatus W. Helm
 Cooling attachment T. A. Aiton
 Core separator J. P. Mallet
 Corn. Apparatus for the treatment of seed... P. Paulsen
 Corn. Device for testing the germinating power of seed... A. R. Francis
 Corn thinner J. P. Bennett
 Corset attachment N. Stenokopf
 Corset buck R. E. Legge
 Counter die and making same P. & M. Lehnert
 Crane A. V. Kiser
 Creel I. E. Palmer
 Cultivator W. C. Hinton
 Cultivator attachment J. J. Young
 Curtain fixture A. G. W. Brown
 Curtain pole J. C. Repp
 Curtain rod C. W. Kirsch
 Cushion wheel J. P. Ho'der

Curtain stretching and drying device. Lace . . . A. Proctor
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 Cut off. Automatic . . . J. D. Patton
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 Deck plate . . . A. R. Hurlburt
 Dental tools. Guard and moistener for . . . C. A. Sevier
 Desk. Hotel register . . . F. F. Doleshy
 Die stock reamer attachment . . . F. S. Barnes
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 Distilling, concentrating, and evaporating liquids . . . J. E. Siebel
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 Doll . . . S. A. West
 Door catch . . . G. W. Mallory
 Door for cold storage rooms. Swing . . . J. F. Drucker
 Door. Metal . . . A. Mandry
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 Dough dividing and sealing machine . . . F. Streich
 Draft equalizer . . . O. J. Boe
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 Dye and making same. Yellow monoazo . . . A. L. Laska
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 Elevator safety attachment . . . A. J. Hallstein
 Elevator system. Multiple . . . C. Foster
 Emergency brake. Automatic . . . W. Cooper
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 Engine lubricator. Explosive . . . J. Powell
 Engine spark ignition system. Explosion . . . R. Varley
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 Explosive . . . 2 pats. O. Silberrad
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 Fence builder. Wire . . . W. S. Hazelton
 Fence machines. Feed mechanism for wire . . . E. Frantz
 Fibers with liquids and gases. Apparatus for treating textile . . . J. O. Obermaier
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 Filaments and films from viscose. Manufacture of . . . C. N. Waite
 File . . . E. G. Dow
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 Filter for caves troughs . . . L. M. Gallier
 Fire escape alarm . . . S. Ashford
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 Firearm . . . R. E. Flyberg
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 Firearm sight . . . R. E. Reardon
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 Furnace . . . W. McClave
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 Gasoline indicator . . . W. F. Pagel
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 Loom picker . . . D. Lemoine
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 Loom pile wire oiling device . . . 2 pats. J. S. Giles
 Loom shuttle check. Power . . . J. F. Blumer-Kunz
 Loops to leather or other material. Machine for setting or affixing pronged . . . W. R. Medearis
 Lubricator . . . G. W. Blank
 Mail bag catching and delivering apparatus . . . S. A. Fraser et al
 Mail carrier's cart . . . W. O. Covey
 Mail carrying device . . . A. A. Lutterman
 Mailing or post card . . . L. Reiman
 Massage device . . . F. S. Cartwright
 Massage instrument . . . W. G. Shelton
 Matrix backing . . . F. H. Brown et al
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 Meat cutting machine . . . I. B. Van Sise
 Metal bending machine . . . G. H. White
 Metal pipe. Flanged . . . L. H. Brinkman

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 Miking machine. Cow . . . F. M. Worcester
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 Mosquito bar. Canopy . . . A. J. Jennings
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 Music leaf turner . . . W. G. Benson
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 Nautical signal . . . F. C. Berwick
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 Nut. Lock . . . J. J. Fifield
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 Ore roasting apparatus . . . R. McKnight
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 Paper making machines. Means for controlling the pulp strainer drums of . . . M. Lamont
 Paper rack . . . J. B. Frear
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 Pebble mill . . . G. S. Emerick
 Peeling and coring machine. Tomato . . . H. A. Crosby
 Pen handle. Fountain . . . F. L. Sturm
 Penholder . . . R. Moore et al
 Pencil . . . F. H. Lippincott
 Pencil sharpener . . . O. G. Sherman
 Pencil sharpener . . . J. J. Vautier
 Perch. Poultry . . . F. Shay
 Permutation lock . . . H. A. Alm
 Phonograph stop mechanism . . . C. Oizer
 Physiographical instrument . . . J. P. Goode
 Piano . . . L. W. Norcross
 Picture frame making machine . . . W. M. Mehlh
 Picture machine. Moving . . . E. J. Rector
 Pictures. Making . . . B. B. Strobe
 Pie cutter . . . C. B. Lewis
 Pile fabric. Woven . . . G. Zimmermann
 Piling. Interlocking metal sheet . . . 3 pats. G. E. Nye
 Pipe and rod grip . . . C. A. Kurlan
 Pipe bending machine . . . G. H. Reynolds
 Planters. Wire guide for check row . . . W. F. Jogerst
 Plow . . . J. H. Samuels
 Plow . . . J. B. Jobson
 Plow attachment. Harness . . . G. E. & J. A. Lile
 Plow. Ditching . . . C. P. Howell
 Plow. shovel and separator. Combined . . . G. T. Sebrell
 Post hole digger . . . G. W. Zwiebel
 Postal souvenir folder . . . W. H. Cowee
 Potato digger and cotton chopper. Combined . . . R. Krause
 Potatoes and other tubers. Growing sweet . . . G. Hitz
 Power transmission device . . . W. F. Howe
 Power transmitting device . . . G. E. Blake
 Printing . . . E. E. Angell
 Printing machine . . . A. V. Beeken
 Printing machine. Fabric . . . A. McNeil
 Printing on stone. Apparatus for . . . K. Reiss
 Propeller . . . A. Driedicz
 Propeller adjusting device . . . W. E. Blair
 Pulley. Clutch . . . G. Beyer
 Pulp making apparatus. Sample tester for . . . M. R. Kennedy
 Pulverizing or grinding mill . . . 3 pats. J. W. Fuller, Jr
 Pulverizing or grinding mills. Metal ring for . . . J. W. Fuller, Jr
 Pump . . . H. C. Clay
 Pump, &c. Air or gas . . . G. Machlet, Jr
 Pump attachment . . . H. Sewell
 Pump. Bottle . . . G. E. Cordeaux
 Pump inlet valves. Unloading device for . . . W. R. McKen, Jr
 Pump. Mercury . . . P. C. Hewitt
 Pump rod belt . . . L. W. Curtis
 Pump support . . . J. S. Weiser
 Pumps. Counterbalance attachment for . . . F. C. Marsh
 Pumps. Oil cup for air . . . W. V. Turner
 Punch and die press . . . G. H. Bartlett
 Putty remover . . . W. H. Hauver
 Rail joint . . . J. H. Martin
 Rail joint . . . C. H. Stephens
 Rail joint . . . W. L. Grant
 Rail joint . . . G. G. Lacray
 Rails from spreading. Means for preventing . . . F. L. Volz
 Railway crossing . . . W. B. Weston
 Railway. Electric . . . S. B. Stewart, Jr
 Railway. Electric . . . W. B. Potter
 Railway switches. Safety signaling device for . . . P. Cloutier
 Railway tie . . . L. Blessing
 Railway tie. Composite . . . W. H. Griffiths
 Railway tie. Composition . . . J. Le Favour et al
 Railway tie. Metallic . . . B. F. Hamilton
 Railway train order system . . . G. F. Thomas
 Railways. Acute angle crossing for electric . . . E. E. Gilmore
 Railways. Third rail protecting mechanism for electric . . . H. Corrigan
 Range . . . J. F. Ruth et al
 Reamer . . . F. J. Lapointe
 Refrigerator fastening . . . G. C. Miller
 Rein guard . . . W. P. Fell
 Reversible seat . . . F. Ort

Rivet. Clip . . . H. F. Cobb
 Rock drill . . . C. E. Shadall
 Rock drills. Attachment for supplying water to . . . E. M. Weston
 Rope clamp. Safety . . . J. Collins
 Rotary engine . . . P. O. Poulson
 Rotary engine . . . J. L. Strickland
 Rule. Folding . . . R. G. Platt
 Saddle pack cover . . . J. A. Evans
 Safety pin . . . S. A. Newman
 Sales case for tobacco, &c . . . L. J. Bailey
 Sample mixer . . . U. A. Garred
 Sanitary T . . . J. L. Fruin
 Sash fastener. Window . . . L. C. A. Denlea
 Sash lock . . . C. S. Lowthorp
 Sash operator. Automatic . . . L. Nees et al
 Saw blade edges. Gage for determining curvature of . . . S. E. Smith
 Sawmill carriage . . . D. Crane
 Sawyer. Steam . . . S. V. Abrego
 Screen house. Portable . . . H. Wingren
 Sealing metal in glass . . . G. H. Meeker
 Seat . . . J. I. Zane
 Seat back support . . . B. F. Fortner
 Seat end . . . E. G. Budd
 Seeding implement. Hand . . . E. W. Ferguson
 Sewing machine. Shoe . . . J. A. Rhout
 Sewing machine tucking attachment . . . F. W. Keiter
 Shade bracket. Window . . . C. Doehler, Sr
 Shade bracket. Window . . . S. Fox
 Shaft coupling . . . G. S. Searle
 Shaft support. Wagon . . . J. B. Wener
 Shaft supporter. Vehicle . . . E. Nestler
 Sharpening lawn mowers. Apparatus for . . . E. C. Springer
 Sheet metal receptacles. Press for closing and opening . . . G. Merckens
 Sh�etree . . . A. Fuller
 Sign. Electric . . . B. Wall
 Sign. Illuminated . . . H. Ruger
 Signal system. Mining . . . N. S. Richmond
 Signals. Transmission of . . . A. Perrin
 Sizing or finishing media. Manufacture of . . . G. Morpurgo
 Skating course or track . . . A. F. Devereux
 Snow plow . . . T. W. Liddell
 Soap dispenser . . . H. J. S. Lewis
 Soap holder . . . C. Owens
 Soap holding or retaining device . . . P. F. Cox
 Soap receptacle . . . G. L. Thorne
 Soap sheet fluting apparatus . . . E. A. Houchin et al
 Soap sheets and articles resulting therefrom. Forming fluted . . . E. A. Houchin et al
 Sod or walk trimmer . . . D. L. Rose
 Speed indicator . . . E. C. Oliver
 Speed indicator. Recording . . . R. P. Brown
 Speed limiting device . . . F. L. Stone
 Speed mechanism. Variable . . . R. E. Rosewarne
 Speed recorder . . . C. C. Clawson
 Spike . . . T. J. Akers
 Spinning and twisting apparatus. Ring . . . J. Hayden, Jr
 Spinning short stapled fibers. Drawing apparatus for . . . J. Perrin
 Stacker. Hay . . . F. A. Kime
 Stains and restoring paint or varnish to its original gloss. Composition for removing . . . R. H. Lee
 Stalk cutter . . . J. P. Cooper
 Stamp shaft tappet . . . L. Mellinger
 Steam or water heater . . . W. C. Oberly
 Steam trap . . . E. J. Kelley
 Steel structure. Cellular . . . J. M. Rude
 Stereoscope . . . C. L. Pappenhausen
 Stone cutting machine . . . A. F. Jones
 Stool . . . P. J. Carlson
 Stove. Heating . . . J. L. Johnson et al
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 Strap loop . . . W. R. Medearis
 Street sweeper . . . V. Houle et al
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 Stuffing box arrangement for agitator shafts in vacuum stirring apparatus . . . F. Kemper
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 Suspension. Flexible . . . W. E. Nickerson
 Switch . . . J. T. Salvo
 Switch point lock . . . J. Noble
 Tailor's chalk sharpener . . . A. Idov
 Talking machine mandrel . . . H. Koch
 Tank float . . . C. Williams
 Tanning compound . . . J. B. Tompkins
 Tapes, shoe laces, elastics, and other articles. Fastener for . . . H. F. Schelling
 Tapper. Beer . . . R. B. Spikes
 Target. Amusement . . . W. E. Shaw
 Telegraph. Printing . . . C. J. Menasco
 Telephone . . . G. Morin
 Telephone repeater system . . . N. G. Warth
 Telephone switch box . . . S. C. Houghton
 Telephone system . . . W. W. Dean
 Telephone system . . . L. F. Muller
 Telephone transmitter attachment . . . F. G. Moulton
 Telephone trunking system . . . W. W. Dean
 Telescope, field glass, and the like . . . K. Martin
 Telescope for submarine boats . . . F. Rehm et al
 Telpier track . . . H. M. Harding
 Temperature regulator . . . B. Barton
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 Thread guide . . . I. E. Palmer
 Thread rolling machine . . . G. B. Lamb et al
 Threshold and weather-strip. Combined . . . D. Duff
 Tire. Elastic . . . S. & R. Basch
 Tire protector. Pneumatic . . . E. I. Tennant
 Tire. Vehicle . . . W. Dunbar
 Tobacco pipe . . . B. Odegard
 Tone producing and recording instrument . . . H. P. Ball
 Tongue attachment. Draft . . . O. Ottosen
 Tool. Combination . . . E. F. Chapman
 Toy . . . W. H. Jackson
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 Toy bank . . . H. Thumann
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 Trace . . . W. H. Falior
 Train report. Self transcribing conductor's . . . G. E. Taylor
 Transmission mechanism . . . G. A. Weaver
 Tree . . . M. D. Berry
 Trolley . . . R. W. Walker
 Trolley controller . . . W. C. Burdon
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 Trolley, hand truck, and the like . . . F. Hass
 Trolley pole . . . Q. Sandell

Trolley wire holder.....V. J. LaBanve
Trousers clasp and belt holder. Combined.....B. A. Grote
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Truck.....E. Bartley
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Turbine engine.....R. Toennes
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Turpentine from wood. Apparatus for extracting.....H. Rasche
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Twyer construction.....U. A. Garred
Type writer platens. Clutch for W. Ruger, Jr
Type writers. Light reflecting attachment for.....L. J. Sims
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Type writing machine.....E. F. Kanath
Type writing machine.....A. T. Browa
Type writing machine...2 pats.....L. P. Diss
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Umbrella.....F. X. Longhery, Sr
Universal joint for shafts or sections of shafts.....J. H. Gault
Unloading, screening and loading apparatus.....J. W. Seaver et al
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Valve.....R. G. Ferguson
Valve. Ball cock.....C. A. Taylor
Valve. Compressor.....N. A. Christensen
Valve. Engine.....P. Paulsen
Valve. Gas.....R. Christ
Valve gear. Engine.....T. Shade
Valve gear. Locomotive.....H. Rainey
Valve mechanism. Reversing.....J. E. Arnold
Valve. Popsafety.....G. E. Contant
Valve. Rotary.....J. W. Eisenhuth
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Vault. Burial.....T. A. Stevenson
Vehicle brake.....W. E. & C. S. Heavily
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Vehicle. Motor.....L. C. Lull
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Vehicle wheel.....E. O. Barnes
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Vending machine. Coin controlled.....A. D. Grover
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Vise.....J. C. Titus
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Wagon. Band.....J. H. Fouts
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Wall molds. Retaining and supporting frame for.....R. Deeds
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Water closet flushing tank.....J. L. Sullivan
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Water lifting motor.....M. M. Vineyard
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Wells. Raising liquids from.....F. J. Moser
Wheels. Sleigh attachment for buggy.....G. G. Ford
Whistle. Automatic.....W. M. & A. M. Cox
Wind shields. Adjustable support for.....O. C. Graff
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Window screen.....E. L. Lloyd
Wire attachment. Ground C. L. Tichenor et al
Wire coupling.....W. Hoffmann
Wire stretcher.....C. P. Moore
Woodworking machines. Rotary cutter for.....C. Karpp
Wrench.....M. W. Thompson
Wrench.....G. Roach

DESIGNS.

Clock case.....B. A. Chubbuck
Dish.....W. F. Donovan
Radiators.....E. Sjoden
Siphon head.....C. de Lukaczevics
Spoons, forks, or similar articles. Handle for.....G. F. Kolb
Urn and pedestal therefor.....O. G. Brnsh
Wall covering.....L. Pronberger

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Adjusting device.....F. H. Richards
Agricultural implement.....F. W. Miller
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Air compressor.....E. J. Bring
Air or other gases. Means for heating compressed.....E. W. Lloyd et al
Air ship.....J. Shukwech
Annunciator.....J. L. McQuarrie
Anvil for riveting machines.....C. Johanneu
Assayer's pouring mold.....J. J. Bailey
Auger bit.....J. T. Parker
Auger. Earth.....T. F. Litaker
Automobile. Water.....W. L. Hynes
Automobiles. Pedal foot rest for.....S. D. Waldon
Awl.....G. A. Peacock
Axle. Vehicle.....E. D. Branch
Bag frame fastener.....B. vom Eigen

Ball. Making-playing.....F. H. Richards
Bandage.....J. J. Walter
Bath cabinet.....J. Hermann
Battery plate and making same. Secondary.....L. N. J. Roselle
Bearing. Axle.....B. Moore
Bearing for grinding wheel shafts.....D. B. Hyde
Bed.....L. H. Flanders
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Bed. Spring.....J. M. Cohron
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Belt.....I. G. Longenecker
Belt stretcher.....O. M. Wolfe
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Bicycle.....H. Garza
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Bicycles and the like. Handle bar for.....D. Cronslow
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Block molding machine.....J. C. Herring
Block molds. Dividing plate for.....F. A. Borst
Block system.....F. B. Corey
Blowpipe.....G. W. Hopkins
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Boat transporting and launching apparatus.....J. J. Harpain
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Boiler safety device. Automatic.....W. S. G. Harris
Boiler trap.....C. Dennis
Boiler tube cleaner.....H. F. Weinland
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Boiler tubes. Setting.....W. M. Dickerson
Book locking device.....W. W. Parsons
Book cover protector.....M. W. Cummings et al
Boot and shoe tread. Pneumatic.....I. Tauber
Bottle.....J. H. Dunstan
Bottle capping machine.....O. S. Beyer
Bottle closure.....D. O. Lynch
Bottle closure.....F. H. Hilt
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Bottle stopper.....H. Morgan
Bottle stopper attachment.....H. Barrow
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Bottle wrapper machine.....M. Costello
Bottles. Support for drying medicine.....C. Lohmann
Bottled goods. Delivery case for.....N. Breckenridge
Bowls and the like. Holder for.....H. Stiemund
Box fastener.....C. H. Veeder
Brace for roundabouts.....J. W. Armistage
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Brake.....V. Lamb
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Brake beam.....J. H. Baker
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Brick making device. Ornamental.....A. H. & M. N. Grant
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Brooder. Poultry.....E. E. Billings
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Bucket. Dumping.....C. Kortvellyessy
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Buckle.....2 pats.....W. A. Schleicher
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Button and loop clasp.....J. D. Conover
Button. Cuff.....E. R. Crecellus
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Can cutter and spout.....E. F. Cavellier
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Car mover.....R. F. Hageman
Car rail and bed.....R. Jackson
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Cars. Adjustable wall and ventilator for stock.....J. Shaw
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Carburetor for gasoline engines.....F. E. Bowers
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Carpet cleaning machine.....W. H. Heffernan et al
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Carton.....H. Conover
Cash receiving and change making machine.....K. Malmstrom
Casting apparatus. Metal.....H. Geisenhoner
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Cement kiln.....W. H. Harding
Cement. Making hydraulic.....E. Mueller
Centrifugal machine.....H. G. Morris
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Chafing dish.....G. E. Savage et al
Chain. Conveyor.....M. Garland
Chair roller appliance. Rocking.....E. W. Raymond
Check or other financial instrument blank.....J. S. Metcalfe
Chimney top.....P. H. Bayley
Chimney top.....S. M. Kemp
Chin rest and shoulder pad support.....J. J. Morrissey

Churn.....N. P. Dazey
Cigarette box.....S. S. Poor
Cigarettes. Machine for making conical.....R. Ermeler
Circuit detecting device.....L. M. Schmidt
Circular distributor.....R. G. Fraser
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Clasp.....O. Fisher
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Coffee percolator.....L. Weidkrow
Coin collector circuit.....H. M. Crane
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Concrete walls. Making.....F. M. Jackson
Condenser. Acid.....J. Broome
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Conduit traveler.....L. D. Shaffer
Conduits. Adjusting means for interlocking.....J. L. Fay
Conveyer. Endless.....F. A. M. Smulders
Cooker. Steam.....C. S. Eppley et al
Cooking utensil.....J. R. Donnelly
Cork holder and bottle stopper. Combined.....J. M. Selden
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Corn gathering machine.....E. P. McClure et al
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Cream separator.....S. W. Stewart
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Cultivator.....W. E. Butterfield
Cultivator.....L. E. Waterman
Cuprammonium solutions. Manufacturing.....J. J. M. A. Vermiesch
Curbing.....C. E. De Clements
Current wheel.....M. J. Miller
Currycomb.....W. D. Wheat
Curtain holder. Vestibule.....W. E. Tippet
Curtain holding device.....G. H. Davis
Curtain or shade fixture. Window.....S. R. Skov
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Cut off. Water spout.....J. P. Kolla
Cut out or fuse box. Automatic.....S. C. Anderson et al
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Damper regulator.....C. S. Hood
Dental engine.....J. A. Lewis
Differential clip for aerial ropeways, &c.....Y. Tamamura
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Display device.....S. W. Huntington
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Distribution system...2 pats.....B. Frankenfeld
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Document holder.....M. I. Sullivan
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Double ended wrench.....G. W. Rowell
Dough dividing machine.....R. J. F. & A. E. Aldred
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Electric apparatus. Vapor.....C. P. Steinmetz
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Fire and temperature alarm or indicator.....G. L. Smith
Fire resisting shutter.....E. H. McCloud
Fish. Preserving.....J. Thonlinson
Fish tank on transporting car or the like.....G. Reinhardt
Fishing reel.....E. Holzmann
Floor. Dumping.....J. F. Dornfeld
Floor surfacing machine.....G. J. Kiebler et al
Flower pot machine.....D. Schwarzkopf
Fluid pressure and motor controller. Automatic.....W. I. Bell
Flying machine.....A. P. Bliven
Fodder cutter.....G. A. Boore
Foot rest.....W. D. Bagley
Fragile vessels. Protective device for.....S. Ferguson
Freezer.....J. H. McKinney
Friction coupling.....H. H. Benn
Fruit gatherer.....E. H. Denton
Fuel block and producing same. Artificial.....M. M. Kline
Fuel blocks. Machine for forming artificial.....M. M. Kline
Furnace front. Water cooled.....A. L. Hammerberg
Furnaces. Compound for facing the ports of open hearth steel.....A. H. Beale et al
Furniture construction.....G. W. Myers
Fuse. Alarm.....W. E. Harkness
Fuse in circuit. Cut out block for connecting.....H. H. Hornsby et al
Game apparatus.....H. L. Heskell
Game apparatus.....J. H. Price
Game board.....A. Collier
Garment pads. Making.....G. Goldman
Garment supporter.....M. Frerksen
Gas burner regulating valve.....F. Egge
Gas engine.....W. H. Ash
Gas generator. Acetylene.....H. S. Gallop
Gas producers. Feed mechanism for.....A. L. Parker
Gas. Purifying.....G. G. Smith
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Gate opener. Automatic.....T. J. McGinnis
Gear. Change speed.....H. T. Thomas
Gear. Reversible transmission.....O. Petri
Gear transmission mechanism.....C. H. Schabinger
Gearing.....J. F. McCanna
Glass furnace.....F. C. Koenig
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Glass ornamentation for panels, floors, &c.....C. O. Newman
Glass structures. Corner clamp for plate.....D. A. Cowan
Glass. Treating.....W. E. Heal
Governing device for marine engines.....W. J. H. Fresen
Governor. Electric and pneumatic.....H. W. Young
Grain elevator.....T. F. Hall
Grain lifter.....L. Wikoff
Grains and similar goods. Pneumatic device for drawing out.....P. & C. Gebhardt
Gramophone record tablet.....J. Sanders
Grass catching receptacle.....L. Brown
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Gyratory crusher.....O. C. Redding
Hair curling device.....H. I. West
Hair weaver.....S. H. Tolman
Hammer. Power.....J. H. Conien
Harrow.....W. C. Cook
Harvester. Pneumatic cotton.....J. E. Worswick
Hay loader.....H. V. Congrove
Hay rack.....C. W. Baird
Headlight. Locomotive.....R. M. Spillman
Headlight. Vehicle.....F. G. Frankenberg
Heater.....E. G. M. Cape et al
Hinge for doors and like movable objects.....O. M. Edwards
Hoe.....D. B. Curry, Jr
Hoist.....W. E. Hinchings
Hoisting apparatus. Automatic stop for electric.....H. S. Valentine
Hoisting machine brake.....G. C. Grable

Continued in June Number.

Canadian Patents.

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated, the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.
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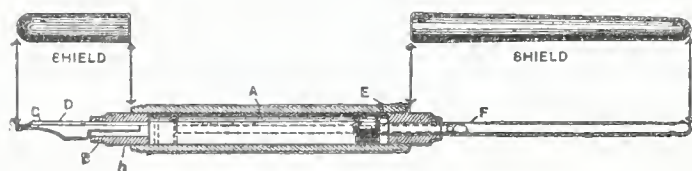
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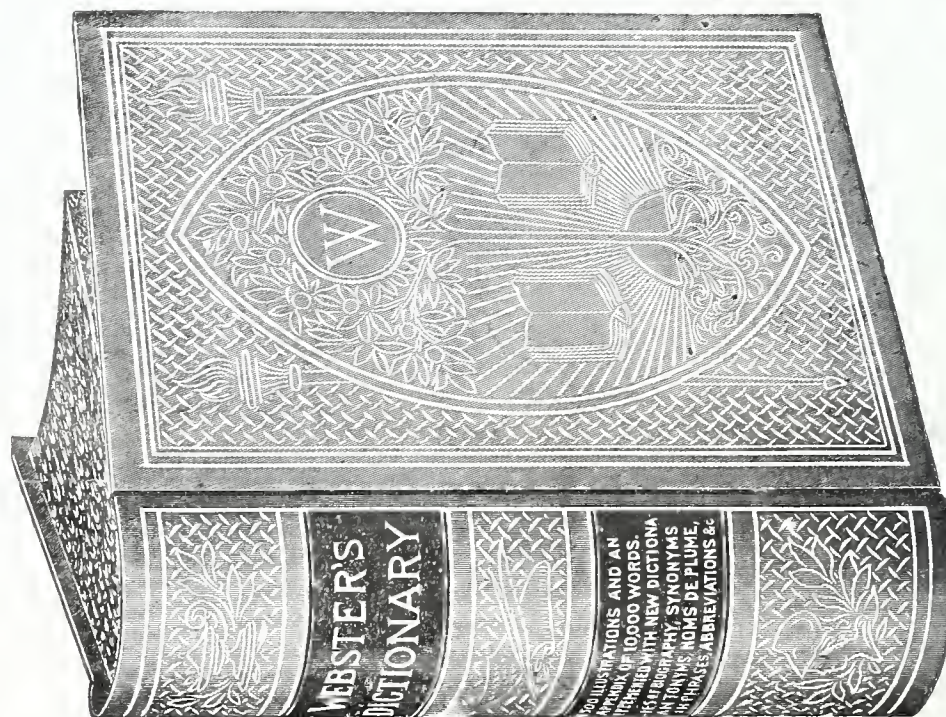
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NINETEENTH YEAR. }
No. 6.

WASHINGTON, D. C.—JUNE, 1907.

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ELECTRIC LIFT BRIDGE.

By L. RAMAKERS.

THE safety and adaptability of electric motors have caused their widespread adoption in connection with the operation of hoisting machinery, winches, etc. The modern harbor has a variety of electric cranes and transporting devices, and electric draw-bridges are used on rivers and canals in every civilized country. The idea of a lift bridge dates back to the medieval constructions that spanned the moats surrounding feudal castles, but its modern development finds the most notable example in the busy waterways of Chicago. The Rush Street bridge, for instance, during the season of lake navigation, is opened and closed 40 times every 24 hours, and the total operation requires less than 20 seconds. It is interesting, on the approach of a boat, to see the bridge break in two, each half rearing upright on the bank on which its end rests—sometimes with a clear lift of 150 feet above the water. Electricity is the motive force, and it is surprising how little power is required. The movable spans are perfectly counter-balanced, and roll with a minimum amount of friction. In some places, by a system of counterweights, the leaves composing a bridge are so adjusted that they are at rest when opened at an incline of about 40 degrees, instead of in the horizontal position which they occupy

when closed. Thus, as soon as the locks are withdrawn, the leaves will roll back and upward, and open the channel.

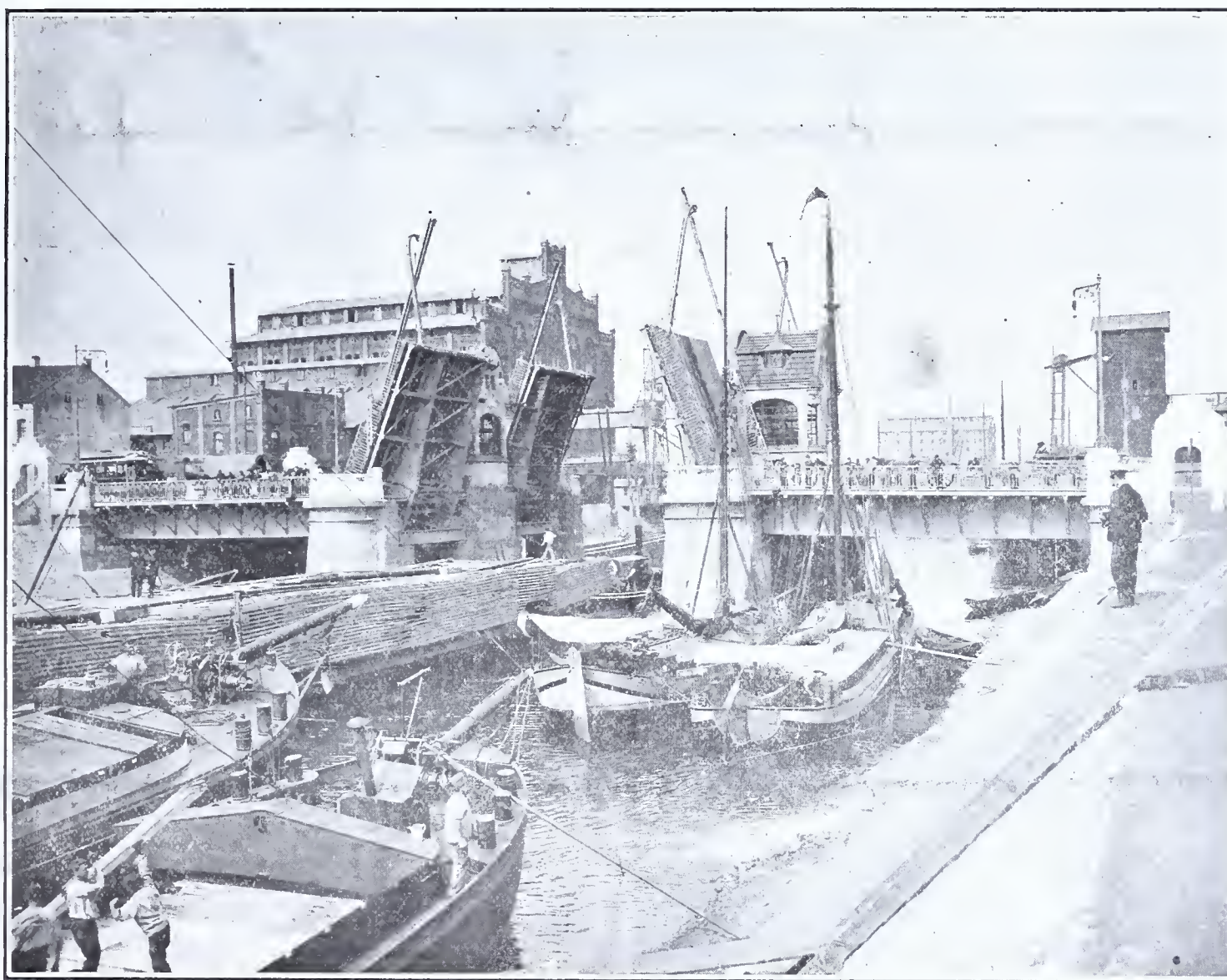
As already stated, these lift bridges find employment in a number of places. There is a four-track railway bridge of this character over the

two motors of 12 horsepower maximum capacity. The electric current is conducted to the motors by means of inverting switches, which are so connected to the motors that both will throw current into one motor. The switch levers may, however, be coupled together as well, so that by motion of

three horsepower, as given by the motor with 840 revolutions per minute. As wind pressure increases, the number of turns of the motor will decrease in proportion, while its output increases at the same time. In order to obtain with still stronger winds the lifting or lowering motion within 20 seconds, as prescribed, the second motor is made to engage with its winding machinery while the two halves of the inverting switches are coupled together so that the two motors may operate two leaves. The number of turns of the motors will decrease to about 450 a minute with the maximum resistance encountered, when the output of the motor increases to 12 horsepower.

In order to bridge over the central joints of a pair of leaves, there are arranged bolts to connect the leaves located diagonally in front of each other: these are operated from the guard's cabin. In order to prevent the guard lifting the leaves of the bridge on one side of the bridge before the bolts have been withdrawn by the guard on the other side of the bridge,

the electric starting apparatus on one side is connected to the lever of the bridge bolts so as to make starting on the other side possible only after the guard has released the bolts. To stop the motion of the leaves, each winch is automatically equipped with breaking magnets.



LIFT BRIDGE AT DUISBERG, GERMANY.

Harlem, and an eight-track one crosses the Chicago drainage canal. The one shown in the illustration is situated at Duisberg, Germany. In this case, the operation of either lowering or lifting is effected by two separate winches, each worked by

one hand lever two inverting switches, and accordingly two motors, may be thrown into circuit simultaneously. Under ordinary conditions, that is to say, with small wind intensities, each motor operates two leaves, this requiring an expenditure of about

STORING COAL UNDER WATER.

The idea of keeping fuel for fires in a perpetually flooded condition is novel to this country, although the practice is familiar to the English. The best way of storing coal is one of the serious problems that confront the modern manufacturer. The frequency of strikes in the mining regions, the shortage of cars on the railways, labor difficulties of the transportation companies, are among the causes that contribute to the uncertainty of the coal supply, and make it imperative that a large stock of fuel should be kept constantly on hand, in order that the wheels of industry may not cease to turn. On the other hand, the danger of spontaneous combustion must be faced, and carefully executed tests have shown that when coal is stored exposed to the air, nearly 30 per cent of the heating value is lost within the short space of six weeks. Experiments made by the British Admiralty, at Portsmouth, England, have shown that if the coal is stored in bins that are kept flooded, both of the above objections are obviated. In fact, in a period of storage lasting from six months to a year, only 2 per cent of its heating value was lost, and the experiment was successful in every other way.

This method is now being tried in this country by the Hawthorne Works of the Western Electric Company, of Chicago—one of the most up to date

when it is needed by means of a locomotive crane fitted with a grab bucket. The accompanying illustrations show the coal pits. Fig. 1 shows

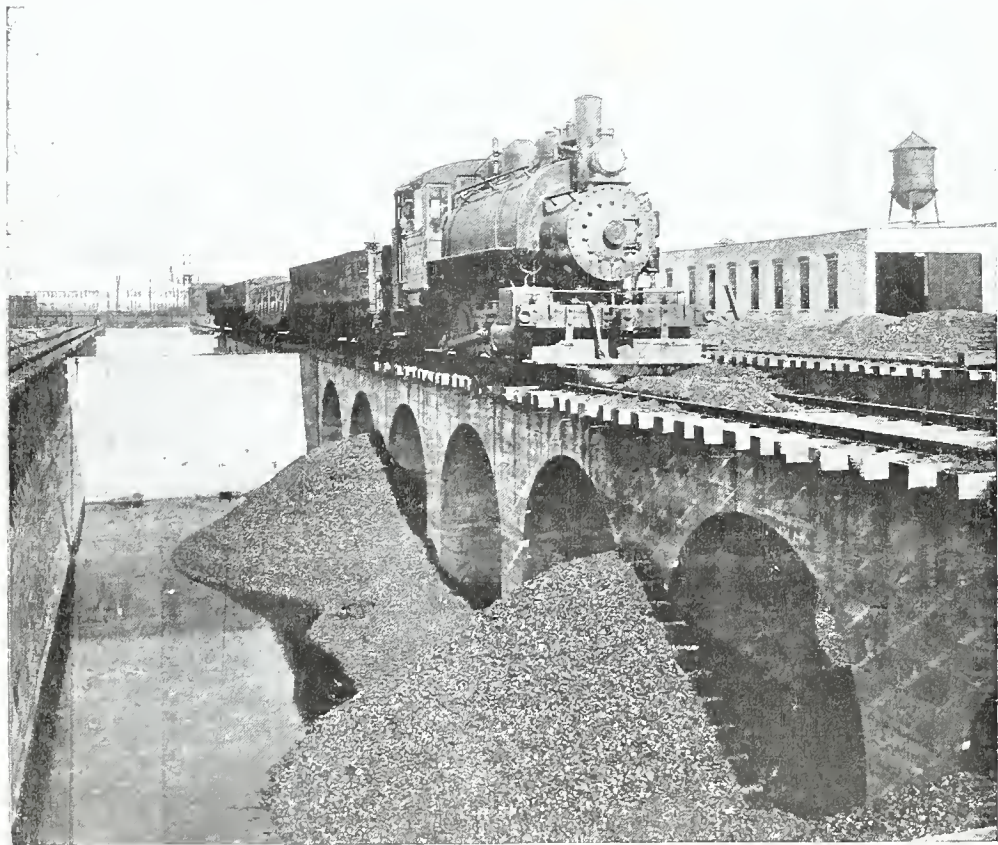


LOCOMOTIVE CRANE FITTED WITH GRAB BUCKET FOR LOADING CARS.

a train in the act of unloading coal into these receptacles, the one in the

loading it onto cars, for removal to furnaces.

The Hawthorne Works, which cover a tract of 110 acres, are also equipped with other modern devices, among which may be noted the automatic fire



SHOWING CONCRETE ARCH CONSTRUCTION PARTIALLY FLOODED.

of our industrial establishments. Two storage bins, one of 4,000 and the other of 10,000 tons capacity, both located below the normal ground level, have been constructed. Into these, coal may be dumped from cars, and removed

foreground being partially flooded with water. Fig. 2 shows a crane mounted on a locomotive, so that it may be moved to any spot desired. It is fitted with a grab bucket, and is lifting the coal from the pockets and

protective system. Each steel post which supports the roof in the huge buildings, has attached to it an automatic sprinkler. The heads of these sprinklers are about 15 feet above the floor, and are designed to protect the posts from danger that may arise from inflammable material gathering about their bases. The sprinklers are supplied with water through an elaborate yard system of about 13,000 feet of 10 and 12 inch water pipe, the feed into each building being controlled by a gate with a post indicator, so that the supply may be regulated without entering the building—a valuable feature in time of fire.

Berth for Seasickness.

It will be glad news to travelers who suffer from seasickness, that a berth has been devised to guard against this malady. It works on a self-leveling principle, being so arranged that it adjusts itself with each motion of the ship. A recent test showed that during a heavy gale the berth kept in a horizontal position, although the ship pitched violently. The bunk was fixed in the fore cabin, where every motion would be felt, but the occupant was entirely comfortable, not noticing even the bumping.

NEW BOOKS.

MODERN AMERICAN LATHE PRACTICE.

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This is a complete and practical work issued for stationary engineers and firemen dealing with the care and management of boilers, engines, pumps, superheated steam, refrigerating machinery, dynamos, motors, elevators, air compressors, and all other branches with which the modern engineer must be familiar. It fully describes and illustrates the properties and use of steam for the generation of power in the various types of engines in use. The Slide Valve, High speed, Corliss, Compound Multi-expansion engines and their valve gear, the De Laval, Parsons, Curtiss and other turbines are included and fully described and illustrated. Forty-two tables of the properties and application of steam in its various uses are included, which in themselves form a most valuable and instructive section of the work.

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Among the recent technical books is a 5 x 7 volume of some 28 pages entitled "The New Century System of Fireproof Construction," published by the Banning Company, 225 Fifth Ave., New York. Although issued in the interests of the New Century Contracting Company, of New York, it is compiled along the lines of a treatise on the use of terra cotta and reinforced concrete as applied to fireproof residence construction. As such it presents valuable data both as to comparative costs and as to parallel points in the various types of residence construction. Generously illustrated with characteristic photographs of various buildings in course of construction and diagrams, the book is of unusual typographical excellence and is of interest to architect, engineer and layman alike.

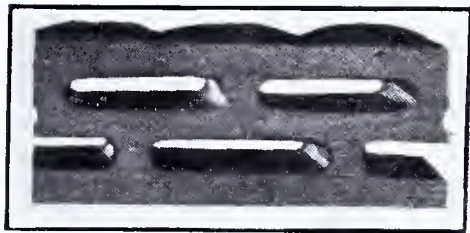
A copy can be obtained free of cost by applying to the New Century Contracting Company, No. 1 Madison Ave., New York.

Conductivity of Air.

Air which has been breathed, it has been discovered, has a higher electrical conductivity than normal air. The air in a lecture room where 140 students were in the habit of assembling was experimented on, and was always found to have higher conductivity just after the students left than before they entered. Similar effects have been observed in the case of sleeping rooms.

LIQUID STONE.

A new king has arisen among structural materials — concrete, or liquid stone as it is frequently called because of its plasticity before it becomes "set." The modern engineer builds the steel skeleton of a skyscraper, with a wooden mould of any desired width about the base of the thin steel girders. Into this mould he forces the liquid stone, permits it to harden for a few hours, and then removes the wooden shields, leaving a smooth wall, which grows harder every day and will stand greater pressure than granite. Concrete, from being a material to be trodden under foot in our sidewalks, or used underground in our sewers, has found application in our loftiest buildings in bridges that leap a hundred feet at a span, in dams, in chimneys, and also in fence posts, roofing tiles, telegraph poles, railroad ties, etc.



HOLLOW CONCRETE BLOCK.

The manufacture of concrete building blocks has become an important industry since the beginning of this century, and in nearly every city and town can be found houses made of

lighten the block, but to prevent moisture from the outside from striking through, or from condensing on the inside, as is often the case with a solid wall. It is the rule to plaster these hollow walls directly on the inside of the block. Another class of these building blocks is known as the "two piece" system, consisting of a comparatively thin longitudinal section, with one or more laterally extending arms which serve for binding the blocks together, or the wall may be made of two sections of plain veneer blocks bonded by metal wall ties. The illustration shows a type of concrete block that has lately been introduced, which contains what are called "staggered" air spaces, each block being formed with two longitudinal rows of apertures, oblong in horizontal section, which extend vertically through the block. The apertures of one row are located opposite the necks of the other row, and when finished there are continuous air chambers from bottom to top of wall.

Re-enforced concrete is now superseding mill and steel frame construction for factories and warehouses, and also for office buildings. The combination of steel and concrete, says D. M. Harper, the Editor of *Concrete*, because of the adhesion between the two materials, amounting to 500 pounds per square inch, as well as their almost equal expansion, has



PARTLY COMPLETED CONCRETE ARCH BRIDGE OVER SAN JOAQUIN RIVER, CALIFORNIA.

this material. Residences made of these blocks are cool in summer and warm in winter, and the growing scarcity of lumber make it certain that concrete will be more and more used for building purposes.

The most common type of concrete block is about two feet long, a foot wide and about 8 inches high. One or more vertical air spaces, amounting in most cases to 33 1-3 per cent. are provided. These serve not only to

given the world a building material far superior to either wood or steel. Concrete is strong in compression but comparatively weak in tension. Steel, being high in tension, is disposed in those parts of girders or beams which are subject to tension stresses. Further, as the steel is entirely cased in concrete, it is free from any tendency to corrode, and is not affected as it would otherwise be from fire.

An equally important application of

concrete is to the construction of bridges. Concrete bridges with clear spans of more than a hundred feet, have been erected both in this country and abroad. The engineer builds a great bridge of slender steel rods, forces concrete within the temporary wooden skin which marks the desired shape, (see illustration) and has, next morning, a structure of strength and beauty, which will defy all the power of winds and waves. Or, where twenty years ago a tall chimney would have been laboriously built up brick by brick, a dozen feet thick at the bottom, he spins his steel spider web, pours his liquid stone into a thin shell of less than a dozen inches, and behold, a slender structure towering hundreds of feet into the air, strong enough to withstand anything short of a cyclone. One of these chimneys, at Butte, Mont. which is 350 feet high or as lofty as the Capitol at Washington, has a thickness of concrete at the bottom of only 14 inches. There are two shells, the outer one 9 inches and the inner one 5 inches thick, which run up to a distance of 100 feet: at that point these two unite into a single 7 inch shell, which extends 250 feet further into the air.

Concrete fence posts would have seemed an absurdity ten years ago, but they are being made with success. They are reenforced with wires in the corners, to which the fence can be fastened. These posts cost no more than those made of cedar and will last indefinitely. Reenforced railroad ties are also meeting with favor. There seems to be, in fact, no place in which concrete cannot be used. Scores of patents are being taken out monthly for new applications of this wonderful material.

Surgery for Animals.

Animal surgery has become so developed that almost every operation that is performed on the human frame has been adapted to dogs, cats, etc. False teeth are provided for them, as well as glass eyes, and artificial legs, although leather is substituted, in this case, for the cork commonly used for human patients. Formerly, the custom was to kill an animal that had been injured, or allow it to continue life limping on three legs, or otherwise handicapped. Now the pets of the rich or the charges of philanthropy are much better cared for. Recently a cat that swallowed a hat pin was put under an X-ray, the pin located, and the extraction successfully effected.

One Hundred Stories High.

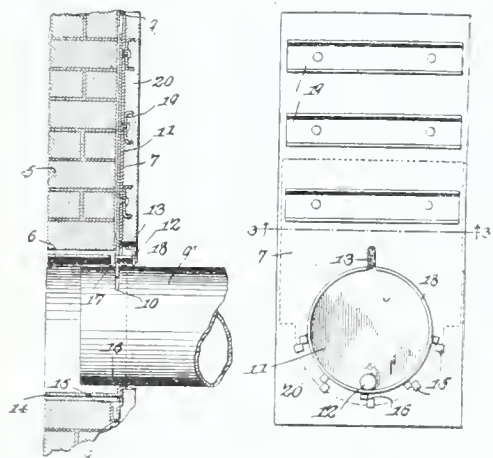
In connection with the projected sky scraper of 100 stories, which is being discussed in New York, a technical contemporary points out that the chief drawback to constructing buildings of such height is the means of ascending. It has been found impossible to provide elevator accommodations for even a 50-story building, for the reason that the weight of the cable to support the car in the 30-story structures is enormous, and some other method of utilizing the upper floors will have to be found before the sky scraper can rise any higher. The limits of the elevator, as at present understood, have already been reached.

CLEVER NEW PATENTS.

Stove Pipe Flue Closure.—High Pressure Faucet.—Filter for Cistern Water.—New Harness Trace Connection.—Improved Swivel Check-Valve.

Stove Pipe Flue Closure.

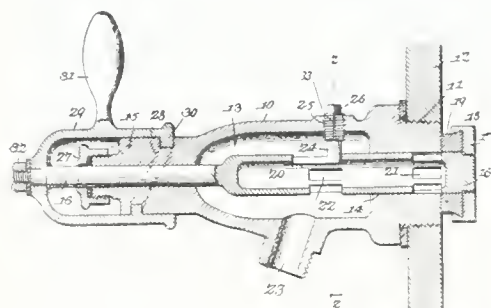
A novel device for automatically closing stove pipe openings in chimneys when the pipe is removed, and for locking the stove-pipe in position when placed in the opening, is the invention of Mr. Chauncey W. Reynolds, Jr., of Colorado City, Colo. He has assigned a one-half interest in the patent obtained thereon to Mr. Obel H. Mock of the same place.



A casing 7 is employed that is located directly above the stove pipe opening, and is provided with transverse reinforcing flanges. This casing is covered by the plaster and therefore is entirely concealed. Within the casing is a vertically slidable plate 11 having a handle knob 12. The end of the pipe is preferably provided with a transverse slot 10. When the pipe is inserted, the slide is lowered and engages in the slot 10, thus locking the pipe against detachment. To remove said pipe, it is only necessary to disengage the lower end of the slide from the slot by raising the slide, and as soon as the pipe has been removed, the plate 11 is moved downwardly and effectively closes the stove pipe hole against the escape of dust and soot.

High Pressure Faucet.

Difficulty has heretofore been experienced in securing properly operating non-leaking faucets for liquids under pressure. Mr. John W. Horth of Salamanca, N. Y., in his patent claims to have invented a highly effective faucet of this structure. The faucet comprises a casing 10 having

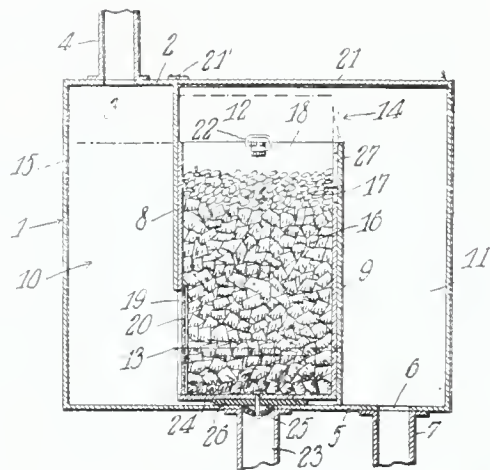


an internal chamber 13 that is provided with a discharge port 23 and a valve seat, the latter being located at its inner end. A valve 19 closes against the seat and is carried by a

tubular stem 16. This stem extends through the chamber and is provided with sets of spaced ports 21 and 22, the former constituting the means of communication with the interior of the receptacle or reservoir when the stem is moved inwardly, the latter set communicating with the interior chamber. A stop pin 24 threaded through the casing engages any one of the ports. On the outer end of the casing is a rotatable operating member 29 that is connected to the valve stem. With this construction, when the cap or member 29 is turned in one direction, the valve stem will be moved inwardly, forcing the valve away from its seat, placing the ports 21 in communication with the interior of the receptacle, so that the liquid will flow therefrom through the interior chamber 13 and thence pass through the discharge port 23. Upon the opposite rotation, the valve will be closed. It will be noted that the pin 24 is provided with a groove 33 which constitutes a vent, allowing complete drainage of all the liquid from the interior of the faucet.

Filter for Cistern Water.

An exceedingly simple and apparently effective water filter is the invention of Mr. O'Neal Watson, a resident of Crawfordsville, Ind. It is particularly intended for filtering rain water in transit from the roof of a house to the cistern, though not necessarily limited to employment in this relation. A casing 1 is employed, to the top of which is connected a supply pipe 4, and to the bottom of which is connected a delivery pipe 7. A partition 8 extends downwardly from the top of the casing adjacent to

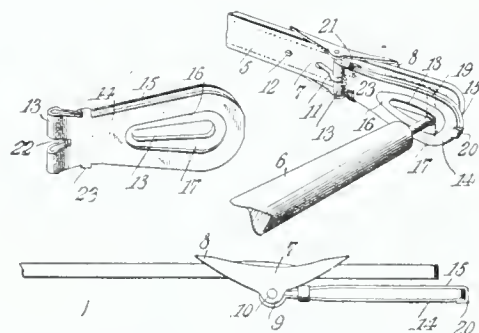


the inlet, and terminates short of the bottom. Another parallel partition extends upwardly from the bottom adjacent to the outlet and terminates short of the top, thus subdividing the interior of the casing into three communicating compartments. A receptacle 18 is movably fitted in the middle compartment and communicates with the inlet compartment through a screen 20. This receptacle furthermore communicates with the outlet compartment at the top. In the receptacle is placed suitable filtering material 16. A drain or flush pipe 23 is connected with the bottom of the middle compartment, and a valve rigidly attached to the bottom of the receptacle normally closes the drain. Under ordinary conditions therefore, the water that enters through the pipe 4 will pass upwardly through the fil-

tering material and discharge through the pipe 7; but if it is desired to flush out the debris and sediment, all that is necessary is to lift the receptacle 18, whereupon the pipe 23 will be opened and the water and collected dirt will flow therethrough.

New Harness Trace Connection.

Mr. Edmond B. Knapp, of Yuma, Ariz., has devised a combination buckle and cockeye for harness traces, which he claims is greatly superior to those now in common use for connecting a trace to a whiffletree, whereby the trace may be readily connected to, and disconnected from, the whiffletree without the necessity of perforating or otherwise forming the usual hook-receiving openings in said trace.

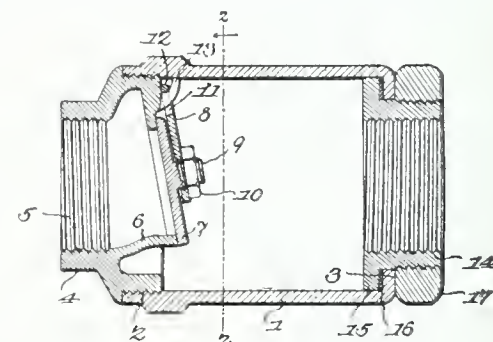


The buckle 7 has a central tongue supporting bar 13 on which is pivoted the tongue 11. This buckle is adjustably secured to the trace. Pivotaly mounted on the bar 13 is the cockeye, which is formed from a single piece of metal bent upon itself to form a loop that receives the bar. The ends thus produced have openings 17 and 18 for the reception of the whiffletree hook 19, and the ends are spaced apart, being connected however by a clip 20. Between the sections thus produced, is placed a strip of yielding material which bears against the pivoted end of the tongue, and has an opening that permits the passage of the whiffletree hook. In order to remove the trace, it is merely necessary to partially rotate the hook 19, when the parts may be readily detached. By having the buckle formed as shown, the same may be used in connection with old or worn traces in which the walls of the hook-receiving

openings have been torn or unduly enlarged, thus permitting apparently useless or discarded traces to be used over again.

Improved Swivel Check-Valve.

Mr. William W. Donaldson, Jr., of Kewanee, Ill., has been granted a patent for specific improvements in swivel check-valves, his object being to provide a union containing a valve which may be readily removed without deranging the pipe system. He employs a pipe section 1 having one end thereof threaded and its opposite end provided with an inwardly extending flange 3. A hub member 4 is screwed into the threaded end and has on its inner end an integral extension 6. This extension has its inner end inclined, to form an obliquely disposed valve seat. A hook 13 projects laterally from the inner end of the hub, and has its bill inclined upwardly so as to engage the interior wall of the pipe section. A hanger 8 having an elongated opening 11 to receive the hook, is furthermore provided with a transverse aperture, and a valve that cooperates with the valve seat has a stem that passes through the aperture, and is held in place by a nut threaded thereon. A suitably threaded sleeve 14 is swiveled in the flanged end of the



pipe. By combining the valve and the hanger in the manner described, the proper coaction between the former and its seat will be secured, and by the manner of combining the hanger with the support 13, free swinging movement of the valve will be permitted without any possibility of accidental disconnection of the parts.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

BATES MACH. CO. v. WM. A. FORCE & CO.

(Circuit Court, S. D. New York. April 17, 1906. 145 F. R. p. 526.)

PATENTS—INFRINGEMENT—NUMBERING MACHINES.

The Bates patent, No. 721,276, for a typographic numbering machine, claims 13, 14, and 15, which relate to a drop-cipher device, were not anticipated, and disclose invention, but are for mere improvements on machines in the prior art, and come within the rule that one who selects and combines elements from the inventions of others into a new structure, adapted to accomplish the old result, is entitled to a patent only for his own particular form of adaptation, and hence are not entitled to the benefit of the doctrine of equivalents. As so limited, held not infringed.

BATES MACH. CO. v. WM. A. FORCE & CO.

(Circuit Court, S. D. New York. April 17, 1906. 145 F. R. p. 529.)

PATENTS—INFRINGEMENT—NUMBERING MACHINE.

The Bates patent, No. 676,054, for a numbering machine, while not for a pioneer invention, covers patentable improvements which overcome objections to the machines of the prior art, and entitle its claims to a reasonably broad construction and range of equivalents. As so construed, claims 2 and 2½ held infringed.

WESTON ELECTRICAL INSTRUMENT CO. v. VALLEE BROS. ELECTRICAL CO.

(Circuit Court, D. New Jersey. May 12, 1906. 145 F. R. p. 534.)

PATENTS—SUIT FOR INFRINGEMENT—EQUITY JURISDICTION.

A bill for infringement of a patent which charges past infringement only and contains no allegation of present or threatened infringement, does not state a case within the jurisdiction of a court of equity, when taken in connection with a plea denying any infringement since more than a year prior to the filing of the bill, and with the fact that the patent expired before the hearing.

UNITED STATES FASTENER CO. v. MEYERS et al.

(Circuit Court, S. D. New York. April 25, 1906. 145 F. R. p. 536.)

PATENTS—INFRINGEMENT—SEPARABLE BUTTONS.

The Pringle patent, No. 589,001, for a separable button, claims 1 and 2, relating to the socket member, disclose a patentable invention, but cover a new combination of old elements, and must be limited to the precise combination shown. As so limited, they are not infringed by the device of the Kerngood patent, No. 645,624.

VON FABER-CASTELL v. FABER.

(Circuit Court of Appeals, Second Circuit, April 25, 1906. 145 F. R. p. 626.)

TRADE-NAMES—"FABER" PENCILS—UNFAIR COMPETITION.

Defendant, John Eberhard Faber, held not entitled to use the word "Faber" without the prefix "E." or "J. E." or "Eberhard" or "J. Eberhard" on lead pencils sold in competition with the German house of A. W. Faber.

UNITED SHOE MACHINERY CO. v. GREENMAN.

(Circuit Court, D. Massachusetts. April 13, 1906. 145 F. R. p. 538.)

1. PATENTS—ANTICIPATION—ABANDONMENT OF MACHINE.

A machine fully embodying a device subsequently patented by another does not lose its effect as an anticipation because its use was abandoned solely for the reason that the product in making which it was employed was not successful, where it is shown that the machine worked successfully and the maker did not abandon the invention embodied therein.

2. SAME.

Notwithstanding that A., having embodied his invention in a machine whose use was soon abandoned, later failed to describe it

in the patent granted him, so that the latter was inoperative, yet the attempt to obtain the patent is evidence that A.'s invention was not an abandoned experiment.

3. SAME—CLUTCH.

The Davey & Ladd patent, No. 672,056, for a clutch, is void for anticipation.

STANDARD COMPUTING SCALE CO. v. COMPUTING SCALE CO.

(Circuit Court of Appeals, Sixth Circuit, May 12, 1906. 145 F. R. p. 627.)

APPEAL—REVERSAL—INSUFFICIENCY OF RECORD.

Where the record fails to show facts essential to a proper decision of the case by the appellate court, it will reverse the decree on its own motion, and remand the case for a rehearing with directions to permit the taking of further evidence.

MARLIN FIREARMS CO. v. DINNAN.

(Circuit Court of Appeals, Second Circuit, April 2, 1906. 145 F. R. p. 628.)

PATENTS—INFRINGEMENT—"TAKE-DOWN" GUNS.

The Hepburn patent, No. 584,177, for a gun of the "take-down" pattern, and relating to means whereby the barrel and stock portions may be readily detached from each other, covers merely improvements on the prior art, and its claims must be narrowly construed. As so construed, held not infringed.

MARLIN FIREARMS CO. v. KELLOGG.

(Circuit Court of Appeals, Second Circuit, April 6, 1906. 145 F. R. p. 631.)

PATENTS—INFRINGEMENT—BREECH-LOADING GUNS.

The Hepburn patent, No. 434,062, for a breech-loading gun, claim 27, which relates to an improved hook extractor, held not infringed.

SCHOCK v. OLSEN & TILGNER MFG. CO. et al.

(Circuit Court, N. D. Illinois, E. D. February 2, 1906. 145 F. R. p. 633.)

PATENTS—INFRINGEMENT—BARREL WASHERS.

The Klamt patent, No. 400,346, and the Schock patent, No. 605,138, each for a barrel-washing apparatus, construed, and, as limited by the prior art, held not infringed.

AMERICAN GRAPHOPHONE CO. v. UNIVERSAL TALKING MACHINE MFG. CO.

(Circuit Court, S. D. New York. February 19, 1906. 145 F. R. p. 636.)

PATENTS—ANTICIPATION—PROCESS FOR MAKING SOUND RECORDS.

The Jones patent, No. 688,739, for a method of producing sound records for use in talking machines of the gramophone type, in which the original record is produced by cutting or engraving the sound groove on a plate of waxlike material by means of the vibrations of the stylus, and a metallic matrix is formed thereon by electrolysis, from which the duplicate records are made by impression, is void for anticipation in the prior art.

AMERICAN GRAPHOPHONE CO. v. AMERICAN RECORD CO.

(Circuit Court, S. D. New York. February 19, 1906. 145 F. R. p. 643.)

PATENTS—ANTICIPATION—PRODUCTION OF SOUND RECORDS.

The Jones patent, No. 688,739, for a method of producing sound records for talking machines, is void for anticipation in the prior art.

AUTOMATIC RACKING MACH. CO. v. WHITE RACKER CO. et al.

(Circuit Court, N. D. Illinois, E. D. February 2, 1906. 145 F. R. p. 643.)

1. PATENTS—CONCLUSIVENESS OF DECISION PATENT OFFICE—SUIT FOR INFRINGEMENT—ESTOPPEL TO DENY VALIDITY.

The defeated party in an interference proceeding in the patent office, which involved only the issue of priority of invention, is not estopped by the decision to contest the validity of the patent granted to the successful party, when sued for its infringement on the ground of lack of patentable novelty or invention.

2. SAME—SETTLEMENT BY LICENSEE—ESTOPPEL AGAINST LICENSEE.

The settlement by a licensee under a patent of a suit brought against it for infringe-

ment of another patent does not estop its licensor, who was not a party, and did not participate in the settlement, from subsequently contesting the validity of the patent sued on.

3. SAME—PRELIMINARY INJUNCTION.

A preliminary injunction against infringement of the Gangwisch patent, No. 647,298, for an apparatus for racking beer, denied, on the ground that its validity was not established by adjudication nor public acquiescence, and was contested by defendant, and could not be determined on the showing made.

MONROE v. RAILWAY APPLIANCE CO.

(Circuit Court, N. D. Illinois, E. D. February 2, 1906. 145 F. R. p. 646.)

PATENTS—NOVELTY—CAR STARTER.

The Ripberger patent, No. 493,736, for a car starter, although merely for an improvement in such devices, discloses patentable novelty, and is valid. Also held infringed.

AMERICAN CEREAL CO. v. ORIENTAL FOOD CO.

(Circuit Court, N. D. Illinois, E. D. February 2, 1906. 145 F. R. p. 649.)

PATENTS—SUIT FOR INFRINGEMENT—SUFFICIENCY OF BILL.

A bill for infringement of a patent is not demurrable because of its failure to allege that the invention was not patented in a foreign country more than seven months prior to the filing of the application in this country: the provision of Rev. St. § 4887, as amended by Act March 3, 1897, c. 391, § 3, 29 Stat. 692 [U. S. Comp. St. 1901 p. 3382], denying the right to a patent in case of such foreign patenting more than seven months prior to the application, being a matter of defense to be pleaded by answer.

MILLER et al. v. WALKER PATENT PIVOTED BIN CO.

(Circuit Court of Appeals, Third Circuit, May 16, 1906. 145 F. R. p. 832.)

PATENTS—ANTICIPATION—TILTING BINS.

The Bacon patent, No. 447,932, for a tilting bin, is void for anticipation.

EASTMAN KODAK CO. v. ANTHONY & SCOVIL COMPANY.

(Circuit Court of Appeals, Second Circuit, April 4, 1906. F. R. p. 833.)

PATENTS—INVENTION—PHOTOGRAPHIC FILM.

The Turner patent, No. 539,713, for a photographic film roll, is void for lack of patentable invention, in view of the prior art.

STAR BALL RETAINER CO. v. KLAHN.

(Circuit Court, D. New Jersey. April 30, 1906. 145 F. R. p. 834.)

1. EQUITY—DEMURRER.

It is not the purpose of a demurrer in equity to raise issues of fact, and, in passing upon one, facts alleged therein must be disregarded, and the allegations of the bill taken as true.

2. PATENTS—SUIT FOR INFRINGEMENT—DEMURRER.

A suit for infringement of a patent will not be determined on demurrer, where the issues raised depend to some extent upon the construction and scope of the claims in view of the prior art.

ROBINS CONVEYING BELT CO. v. AMERICAN ROAD MACH. CO.

(Circuit Court of Appeals, Third Circuit, June 6, 1906. 145 F. R. p. 923.)

1. PATENTS—CONSTRUCTION OF CLAIMS—REFERENCE TO SPECIFICATION AND DRAWINGS.

Where the meaning of the language used in the claims of a patent is doubtful, or it is susceptible of two different constructions, the specification and drawings may properly be referred to for the purpose of ascertaining the true construction of the claims.

2. SAME—INFRINGEMENT—SUBSTITUTION OF EQUIVALENTS.

A pulley revolving on a central shaft and one having trunnions revolving in bearings at the ends are well known mechanical equivalents, and the substitution of one for the other, which is an element in a patented combination, does not avoid infringement.

3. SAME—IDLERS FOR BELT CONVEYORS.

The Robins patent, No. 571,604, for a belt conveyor, claims 5 and 6 of which cover troughing idlers for supporting such conveyor-belts, were not anticipated, and in view of the superior utility of the device over those in prior use and its immediate com-

mercial success, must be held to disclose patentable invention. Also held infringed.

SCOTT et al. v. FISHER KNITTING MACH. CO. et al. SAME v. REGAL TEXTILE CO. et al. SAME v. FISHER KNIT GOODS CO. et al. SAME v. SEAL BACK UNDERWEAR CO.

et al.

(Circuit Court of Appeals, Second Circuit, May 22, 1906. 145 F. R. p. 915.)

PATENTS—INFRINGEMENT—KNITTING MACHINES.

The Bellis patent, No. 561,559, for a knitting machine capable of producing loops on a ribbed fabric adapted to be fleeced, is one of primary character, covering a meritorious invention, and entitled to a broad construction, and is infringed by the machine of the Fisher patent, No. 656,555.

WILLIAMS CALK CO. v. KEMMER et al.

(Circuit Court of Appeals, Third Circuit, June 6, 1906. 145 F. R. p. 928.)

1. PATENTS—DESIGNS—SUBJECTS PATENTABLE.

An article to be a proper subject for a design patent must be one which by artistic treatment in form and configuration may be given value from an aesthetic point of view.

2. SAME—HORSESHOE CALK.

The Williams design patent, No. 29,793, for a horseshoe calk, is void because the subject of it is not one patentable as a design.

3. SAME—INFRINGEMENT—HORSESHOE CALK.

The Williams patent, No. 666,583, for a horseshoe calk, if valid, is limited by the prior art and by the proceedings in the patent office to the precise structure shown. As so limited, held not infringed.

CORTELYOU et al. v. CHARLES E. JOHNSON & CO.

(Circuit Court of Appeals, Second Circuit, March 16, 1906. 145 F. R. p. 933.)

1. PATENTS—CONTRIBUTORY INFRINGEMENT—LIMITATION OF DOCTRINE.

The doctrine of contributory infringement should be limited to cases where the articles sold are either parts of a patented combination or device, or are produced for the sole purpose of being so used as to constitute infringement, and should not be extended to apply to ordinary and staple articles of commerce, used in connection with a patented machine, because the patentee sells or licenses such machine upon the condition that he alone shall furnish such articles. Townsend, Circuit Judge, dissenting.

2. SAME—SUFFICIENCY OF PROOF.

Evidence considered, and held insufficient to sustain the burden of proof resting on a complainant to show that defendant had knowledge of restrictions contained in the licenses granted by complainant by users of its patented machines, so as to charge defendant with liability for contributory infringement in selling an article to such users to be used in violation of such restrictions.

AMERICAN SALESBOOK CO. et al. v. CARTER-CRUME CO. Limited, et al.

(Circuit Court, W. D. New York. April 30, 1906. 145 F. R. p. 939.)

PATENTS—INVENTION—MANIFOLDING SALESBOOKS.

The Beck patent, No. 647,934, for a manifolding salesbook and holder, the purpose of the improvement being to facilitate the manipulating of the leaves without soiling the fingers with the carbon sheet, was not anticipated, and in view of the success of the device shown must be conceded invention. Also held infringed.

LEONARD v. SIMPLEX ELECTRIC HEATING CO. et al.

(Circuit Court, S. D. New York. December 1, 1905. 145 F. R. p. 946.)

JUDGEMENT—RES ADJUDICATA—PATENTS—SUIT FOR INFRINGEMENT.

The bill in a suit for infringement of a patent alleged that defendant claimed the right to make the alleged infringing articles by virtue of another patent, and that the same was void, because for the same invention, and granted on a latter application than complainant's. Defendant, however, did not set up such patent as a defense, nor were any proofs taken in relation thereto. Held, that a decree for complainant in the suit was not an adjudication upon the validity of such patent, which was not within the issue, and did not constitute a bar to a subsequent suit between the same parties for its infringement.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

Oscar C. Moen, inventor, Connells-ville, Pa.: August Stickel, assignee, same place. **Lubricating Axle.**—The object of the present invention is to improve the construction of lubricating axles for carriages, wagons, etc., and to increase their strength and durability. The axle is adapted to enable either oil or grease to be employed as a lubricant, and it positively feeds the same to the spindle and prevents the lubricant from leaking or wasting. The axle is provided with means for preventing the operating device from being affected by the jar and vibration incident to the motion of a vehicle, so that there will be no liability of the parts becoming lost. The device comprises a feed passage, a threaded lubricant cup, a threaded cap engaging the cup, and a spring disposed longitudinally of the axle and secured at one end to the same, and provided at its other end with means for engaging the cap for holding the latter against rotation.

Oren Lynch, Richmond, Mo. **Tire Tightener.**—The invention relates to improvements in tire tighteners, and the object is to provide a simple, inexpensive and efficient device, designed for use on various kinds of vehicle wheels, and adapted to be applied to the same by a person with little experience without liability of dishing a wheel. The invention consists of a wedge provided with a head having inwardly and outwardly projecting portions, the inwardly extending portion being arranged to fit flat against the felly of a wheel, and the inner face of the outwardly extending portion being arranged at an angle to that of the inwardly extending portion, whereby it is adapted to engage the projecting portion of the tire.

George Towers, Canon City, Colo. **Fruit Scissors.**—The fruit scissors devised by this inventor is adapted for cutting fruits which must be picked with the stem, in order to prevent injury to the gathered fruit. It is connected with the thumb and forefinger of the hand, and is capable of permitting the thumb to be arranged crosswise or at right angles to the forefinger in its natural position, whereby the greatest force may be brought to bear in operating the device, enabling the fruit to be readily grasped while severing the stem. The device comprises two blades pivoted together at one end, a sleeve connected at one side with one of the blades at a point between the ends of said blade and extending longitudinally along said blade to permit the forefinger to lie against the back of said blade, and a loop or ring for the thumb mounted on the other blade at a point between the ends of the said blade, and diametrically opposite the sleeve.

David A. High, Ashley, Ohio. **Bridle Blind.**—This invention relates to improvements in bridle blinds, more especially the means for attaching the same to a bridle, and to provide a simple and efficient device, adapted to enable the blinds of a bridle to be readily attached to, and removed from, the same when desired, whereby a horse may be worked either with or without blinds. The bridle blind embodies a clamp composed of two jaws, a spring for holding the jaws in engagement with a bridle, a pin or spur extending inwardly from one of the jaws, and a blind-receiving clip extending from the clamp and fixed to one of the jaws.

Samuel Bates, North Liberty, Ind. **Pole Tip.**—The pole tip of the present invention has for its object to provide a simple and efficient device of great strength and durability, adapted to be readily applied to the end of a pole or tongue, and capable of securely retaining the ring of a neck yoke in engagement with the same, whereby the tongue or pole is effectually prevented from dropping while a team is hitched to the same. This device also prevents the lines from becoming caught on the end of a pole or tongue or interfering with the locking device. The pole tip embodies a loop provided with top and bottom plates, a fixed catch or keeper, and a spring actuated bolt piercing the tongue and provided at the upper face thereof with operating means.

Walter H. Huxford, Beaver Meadow, Ala. **Plow Point.**—The aim of the present invention is to improve the construction of plow points, and to provide a detachable one, which will be simple and comparatively inexpensive, whereby when a plow point becomes worn, it can be readily removed and renewed without the services of a skilled mechanic. The device consists of a plowshare having a recess or cut-away portion, and provided at opposite sides of the same with projecting supporting flanges, and a plow point fitting within the recess or cut-away portion, said plow point being provided with lugs engaging the flanges and forming with the same an interlocking connection between the plow point and the plowshare.

Eugene F. Long, Scranton, Pa. **Miner's Lamp.**—This invention relates to a miner's lamp from which any leakage of oil will be effectually prevented. The front, sides and upper portions of this lamp are imperforate, so that there is no danger of the solder being melted by the flame. The device comprises a body, a collar fitted on the body and having inner and outer flanges, the outer flange being off-set to provide grooves, a pintle rod secured in the grooves, and a lid having an eye receiving the pintle rod. The lid is securely hinged to the body portion without puncturing the latter.

George W. Wright, McColl, S. C. **Burglar Trap.**—This invention is designed for use in banks, mercantile establishments, residences and various other places, and adapted to be conveniently arranged adjacent to a safe, or at an entrance, and capable of being automatically sprung by the weight of a person, and of confining and locking the captured person to effectually prevent his escape. This trap is capable of being securely locked against operation to prevent it from being sprung during the day or other desired time, and adapted to be readily set when it is desired to arrange it for automatic operation. The invention comprises a well or casing, a vertically movable trap door, means for closing the well or casing when the trap is sprung, and mechanism actuated by the trap door for operating the said means.

Benjamin E. Lockett, Jefferson City, Mo. **Tarpaulin Rack.**—The object of the present invention is to provide a tarpaulin rack, designed for protecting various goods, wares and merchandise from dust, sun, rain and the like, and adapted for use both indoors and outdoors, and capable of enabling the tarpaulin to be handled more easily and effectively than heretofore, and of being compactly folded for shipping or storing. The rack comprises a casing, a foldable frame receiving the casing and composed of end pieces, end bars spaced from the end pieces, foldable legs mounted between the end bars and the end pieces, and foldable side bars connected with the end bars, and curtains or covers mounted on the rack.

Nathan Soesbe and George Soesbe, Central City, Ia. **Gate.**—It is the aim of the present invention to provide a simple and efficient gate, which may be readily raised and lowered to enable it to clear snow and other obstructions, and to form a passage-way for small animals for separating stock. The gate embraces hinge members, an arm having a pivot fitted in the upper end of a pintle rod, the arm being arranged to swing horizontally, a guide carried by the arm, a flexible connection passing through the guide and secured at one end to the gate, and a lever connected with the other end of the flexible connection.

Brantley D. Tew and Ebenezer Mizell, Parmele, N. C. **Stake Socket for Cars.**—It is the aim of this invention to improve the construction of stake sockets for logging cars, so as to firmly hold a stake or standard and prevent a load of logs from accidentally slipping or spilling from a car. The stake socket is adapted to be operated by a light pull while the operator is in a position of perfect safety, so that there will be no liability of the operator being accidentally injured by the logs while releasing a load. The device comprises face plates, side bars fitted against and extending beyond the face plates, transverse fastening devices, an end bar extending across the space between the side bars, a locking bar or hasp connected with the end bar, and means for securing the locking bar or hasp.

John S. Dickey, Collinsville, Texas. **Acetylene Gas Generator.**—The generator of this invention is capable of automatic operation to feed the carbide, when the supply of gas falls below a predetermined quantity, and to shut off the supply of carbide when the volume of gas generated by the machine reaches a predetermined point. The generator is provided with an automatically-operable valve or cut-off, adapted to control the discharge of carbide from the hopper, and it enables the carbide to be automatically scattered over the surface of the water and permits the accumulation at the bottom of the machine to be readily agitated. The machine is provided with a casing, a bell, a hopper, a discharge tube extending into the hopper, a valve, and a guard or shield receiving the valve, and also means for operating the valve.

Robert Lichtner, Chicago, Ill., inventor; Arthur H. Gossling, Shawnee, Okla., assignee. **Lubricator.**—This invention relates to lubricators, designed for use on locomotives, engines and various kinds of machinery, and adapted to afford a continuous supply of oil to the bearings, and to indicate the quantity of oil supplied to the bearings to enable the engineer to ascertain positively if the lubricator is working properly, and if the amount indicated by the dial or scale is being delivered to the bearings. The device consists of a reservoir, a pump, a stub shaft having a head, a ratchet wheel composed of sections, a wrist pin carried by the ratchet wheel, means for connecting the wrist pin with the pump, and mechanism for actuating the ratchet wheel.

Charles Brandt, Chicago, Ill. **Railroad Velocipede.**—This velocipede is adapted, when not in use, to be compactly folded for enabling it to be conveniently carried on a train, and capable of being quickly set up for use in case of an accident to enable a brakeman or other trainman to run back the desired distance for flagging the next train, or to obtain assistance, or for any other purpose. The velocipede is provided with a frame having a wheel mounted thereon, and a movable foot rest provided with a brake-shoe for engaging the said wheel.

James F. Kuhn, Easton, Pa. **Clasp Pin.**—This device is an exceedingly ornamental pin that is constructed of a single piece of wire. It consists of a body having a straight bar, a pin stem having an integral spring coil connection with one end of the straight bar and constituting one terminal of the wire. A catch is located at the other end of the straight bar, and has a loop that is doubled to form a pin-receiving seat. This loop has side members that are crossed, and the other terminal portion extends from the loop and is twisted around the straight bar, its end being engaged in the spring coil of the pin.

Charley McDonner, inventor, Manitowoc, Wisc.; Jerome R. McLain and Albert E. Montgomery, assignees, Marinette, Wisc. **Curtain Hanger.**—The invention relates to means for supporting curtains, portieres and the like, and the object is to provide a simple article, which can be readily placed in position, and which can be easily adjusted to suit different sizes of doors or windows. The brackets are in pairs. Each one consists of a base, which is secured to the frame by screws, and has outstanding studs. Slidably mounted on the studs is another block that is adjustable, but is held against adjustment by a nut threaded upon one of the studs. The end of the slidable block has a longitudinal projecting stem on which is secured an outstanding curtain bracket, the bracket being adjustable on the stem, but being held against movement by a nut threaded upon the same.

Charley McDonner, inventor, Manitowoc, Wisc.; Charles Ahlgrim and Joseph J. Roemer, assignees, same place. **Refrigerator.**—The object of the present invention is to improve the construction of refrigerators, more especially the construction of the ice chamber, and to provide an ice box or chest, which will be removable from a refrigerator to enable it to be filled and cleaned outside a house or any convenient place to prevent the floor of the room or apartment in which the refrigerator is placed from being wet by the ice, and also to prevent sawdust from dropping from the ice upon the floor. The ice chest is adapted to preserve the ice contained within it, and to reduce the melting thereof to a minimum, and at the same time afford a free circulation of cold air throughout the refrigerator. The ice box or chest is composed of inner and outer shells constructed of sheet metal and spaced apart to provide an air-tight intervening cold air space, a valved inlet for supplying the cold air space with air under pressure, absorbent non heat conducting linings located within the said cold air space and arranged on the shells, and bars interposed between the shells and retaining the said linings in place and provided with openings to permit a circulation due to changes in temperature.

William D. Lloyd, inventor, Austin, Tex.; John B. Vinson, assignee, same place. **Motor Vehicle.**—The object of the present invention is to improve the running gear of motor vehicles, and to provide a strong and durable one, adapted to afford a sufficient support for the motor and driving gears at a point beneath the body of the vehicle, and between the front and rear axles where a load can be carried to the greatest advantage. The motor vehicle consists of front and rear arched axles, the rear axle being provided with independently rotatable spindles, bolsters supported by the axles, a body, springs mounted on the bolsters and supporting the body, a motor-receiving platform rigidly connected with the bolsters, driving shafts mounted on the platform at opposite sides thereof, and sprocket gearing connecting the driving shafts with the inner ends of the said spindles.



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FOR SALE outright or on royalty—Patent No. 845,551, dated Feb. 26, 1907. Harvesting Apparatus. Has been tested. A success for heading kafir corn, maize, sorghum, etc. Address the inventors, Russell & Armistead, Abilene, Texas. aug

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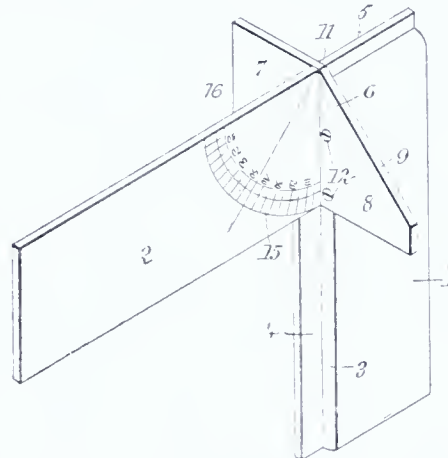
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Novel Uses of the Phonograph.

The phonograph has been put to uses of which its inventor probably never dreamed. It is the cherished toy of such Eastern potentates as the Shah of Persia and the king of Siam, and the music that issues from its cylinder has been used to soothe the savage ear from Terra del Fuego to the Aleutian Islands. But it remained for the enterprising agent of a colonization company to put it to its most novel use. It was desired to take a number of the inhabitants of the South Sea Islands to Australia, and a few had actually been transferred; but most of the remainder were timid and no representations of the agent moved them. So he availed himself of the resources of modern science, and on his next trip the savages were shown photographs (thrown on a screen by means of a magic lantern) of their friends who had gone to Australia, and at the same time their familiar voices were heard, declaring that it was all right, that they liked the country, and urging the others to join them. The plan proved most effective, and the agent secured a large number of contracts.

Another remarkable use of the phonograph was by an exploring party in New Guinea. The aborigines of this island are perhaps the most untouched by civilization, except those in the heart of Africa, now to be found on the globe. The explorers had pitched their tents near the shore and were making excursions in the neighborhood. One night it was found that a large party of hostile savages were about to attack them. To retreat openly would have been to invite destruction. A quick-witted member of the group opened the phonograph that happened to be among the luggage, and set it at a lively monologue. The enemy, hearing the sound of voices and laughter, lay still and waited until their victims should fall asleep. Meanwhile, under cover of the noise, a hasty retreat from the rear of the tents was effected, the party gaining the boat and pushing off. A few rods from the shore, however, angry cries

warned them that their ruse was discovered: the tents were fired, and by the light of the flames the savages could be seen running to and fro in search of the white men, and finally coming to the water's edge to fire arrows after them. No harm was done, however, and the party escaped with whole skins, thanks to the phonograph, which in this case proved as effective an instrument of war as a Gatling gun.

New Uses of Concrete.

It is curious to note how invention, as well as history, repeats itself. Many arts that were familiar to the ancients and were lost during the Dark Ages, have been rediscovered and hailed by the world as triumphs of nineteenth or twentieth century civilization. Many others have never been discovered again: it still baffles us to guess how the Pyramids were built; how the old roads in Peru were constructed with the appliances known to exist at that time, remains a puzzle to engineers; and—to come a few centuries nearer—the secret of coloring familiar to the painters of the days of Titian and Tintoretto is, in spite of eager research on the part of modern artists and chemists, still a lost art.

An interesting example of the revival of an ancient industry is in the use of concrete. This artificial stone (a mixture of cement, sand, crushed stone and water) is as old as civilization itself. The largest dome in the world—the Pantheon at Rome—which has stood over 2,000 years, is made of concrete. But ages before the Romans employed it, it was to be found in the buildings of the Egyptians, of the Aztecs and of the people of India. But its use was lost for centuries, and it was not until a hundred years ago that it was revived, with the discovery of Portland cement. It was employed at first only in that form, but after the Civil War, concrete proper was re-evolved.

The properties of concrete are so advantageous that engineers generally recognize them. It is as strong as stone, fireproof, and can be used for permanent construction on the equator or in the Arctic Zone. In its early stages it is plastic, rendering it easy to manipulate, and it expands and contracts, in response to the changing seasons, in practically the same degree as iron or steel, so that it can be safely combined with these. Furthermore, it is extremely cheap—an important item in view of the steady rise in price of other materials necessary for construction.

The use of plain concrete was for a long time limited to walls, foundations, etc., because of its low tensile strength, which made it costly in cases where cross-bending stresses were encountered. A later discovery overcame this difficulty, and has adapted concrete to many new uses: it consists in imbedding in the concrete, steel rods of the proper sizes, which take care of all tensile stresses from bending, change of temperature, and initial set of concrete. This is called re-enforced concrete, and it is being employed for houses and many other constructions, as described in

another column. Perhaps, however, its most important application is to bridges.

Up to a few years ago, bridges were made of stone in the form of arches; but this form of construction was expensive and not always adapted to special localities. In the last generation engineers began to give us iron bridges, and these in time gave way to the steel bridge, which was considered the ne plus ultra of construction in this line. But it was discovered that while steel, if protected from corrosion, will last indefinitely, it becomes "fatigued" when subjected to a great number of vibrations. Under continual vibration the molecular form of the metal becomes altered in a manner that resembles crystallization; a rod, for instance, which has been so changed in character is more brittle than cast iron. This is where re-enforced or armored concrete comes in, offering a material at once strong, plastic, permanent and economical. Europeans were the first to develop it for bridge construction, but American engineers are catching up with, and will soon equal the work on the other side of the water. The bridges of this substance are so successful that they will probably in the course of a decade or so replace all others. Tests have shown that a load concentrated on one arch causes a slight rise in the adjacent arches—a proof that re-enforced structures are truly monolithic.

Developments in Automobiles.

However much we may have surpassed Europe in many lines of mechanics, we have still something to learn from them in the construction of automobiles. The excellent roads abroad have doubtless done much to promote this industry, and, in spite of the rapid strides made recently by our own manufacturers, the highest grade of motor cars are still largely imported. Consequently, the foreign automobile expositions attract a large contingent of Americans, and the one recently held in Berlin contained many machines a description of which (contained in a consular report from that city) will be of interest to those in this country. It is true that little was shown that was strikingly novel, but great progress, it is said, was exhibited in details of construction, methods of transmission, in brakes, in coach work, refinement of design, etc. There is a strong tendency toward simplicity, in making the chassis of the machine as little complicated as possible, and in rendering the working parts of the motor easily accessible.

Nearly all of the cars exhibited had vertical water-cooled cylinders, cast singly and in pairs. Practically all, too, had mechanically operated valves placed on both sides of the cylinders, though in a few cases they were on one side and in two cars, on top. The methods of ignition were about equally divided between the "make and break" and "jump spark." Many of the larger cars had two ignitions, in which cases the high tension magnets with jump spark and the battery ignition, both of which can be worked independently, were used. It is claimed

that a considerable increase of engine power can be obtained by operating the two ignitions simultaneously.

The Pitler hydraulic oil system is a new method of transmitting power, and is at least interesting. It is built on the hydraulic principle, oil instead of water being used. The oil is compressed by a pump driven by a benzine motor and conveyed in tubes to the rear axle. The rear axle is constructed somewhat in the manner of a double turbine, each turbine operating its own driving wheel independent of the other. In this manner the differential and the gear box for changes of speeds are dispensed with. The tubes conveying the oil to the rear axle are fitted with a by-pass valve governed by a lever within reach of the chauffeur, which allows a portion of the oil to be returned to the tank, and in this manner the regulation of the speed is effected.

With a few exceptions, the sliding-gear transmission was seen on most of the benzine cars in the exposition. The direct-bevel gear and the chain drives were about equally divided, but the tendency seems to be in favor of the former, even on the larger cars up to 50 horsepower. Some of the well known firms who have of late only used the chain, are now offering their clients the propeller shaft transmission. In their efforts toward simplicity, some of the manufacturers have omitted the speed regulator, as it is considered a superfluous complication.

The principle of the float carbureter as used on the standard European cars has not been changed, but improvements have been made by arrangements for a better mixture of gas and air, also by warming the carbureter with the water which has been used for covering the motor, and some manufacturers give the carbureter a second injection of cold air, after the gas has been formed mechanically.

Nearly every car was equipped with revolving pumps for water circulation, driven by spur gears instead of chains, belts or friction wheels. The better cars showed the honeycomb system of cooling, and had positive oil pumps for the circulation of oil for lubrication.

Salt Water for Road Dust.

A European medical society, in a recent pamphlet, calls attention to the evils arising from dust, and discusses remedies. Tar has advocates as a layer of dust, but its use has disagreeable accompaniments. Sea salt has been suggested, the idea being based upon its property of absorbing the moisture of the atmosphere. It is claimed that this property will dampen the dust and prevent its dissemination. The merits of sea water are also exploited. If the latter is evaporated in large shallow trays by the rays of the sun, the different salts will crystallize in order of insolubility. A few quarts of this "mother sea water," mixed with a ton, say, of ordinary water, will be found efficacious in laying dust and preventing its dissemination. The expense, especially for cities on the coast, would seem to be trifling. No disagreeable odors will offend the nostrils, it is declared, and no deleterious effects will follow its use.

Photographs on Finger Nails.

There has been a fad of late for having a photo placed on one's finger nail. Many young brides have their husband's photograph impressed on the nail of the ring finger. It is done by the carbon process, the photo being first taken in the ordinary way and then reduced to the proper size. From the negative a print is made upon carbon paper, which, after being fixed and toned, is transferred to transfer paper. The next step in the process is to polish the finger nail carefully with pumice stone until it is quite smooth. On this nail the wet transfer paper is placed, and when the whole is dry and the paper is pulled off, the photo remains on the nail, to be varnished over with a transparent enamel. The hands can be washed without injury to the photograph, which lasts for some time.

Preserving Eggs.

Of all the methods of preserving eggs that have been tested in laboratories and elsewhere, the use of liquid glass has received most approval. An old domestic method is to pack the eggs in bran, oats or salt, or to cover them with limewater. Efforts have also been made to keep them by wrapping them in paper, by rubbing with salicylic acid and glycerin, or by varnishing with shellac or colloid. Permanganate of potash, peat dust, wood ashes, boric acid, and vaseline are also used. But liquid glass—the popular name for sodium silicate—gives the best results. This soluble glass is sold either as a thick, syrup like liquid, or as a powder. The liquid is sold as low as 2 cents a pound, in large lots, and the retail price is about 10 cents a pound. A solution of the desired strength for preserving eggs is made by dissolving one part of the liquid in ten parts of water. If the powder is used, less is required. The solution should be carefully poured over the eggs packed in a suitable vessel, and the whole kept in a cool place. One gallon of liquid glass will make enough solution for 50 dozen eggs.

New Method of Making Tunnels.

American engineering has performed some wonderful feats in tunnelling. So common has it become to bore under the Hudson, in fact, that no very great wave of interest is aroused when a new tunnel is cut under that historic stream. However, equally wonderful feats are performed in other countries and by methods that differ from our own, says the *Pathfinder*. In Paris, for instance, the tunnels for the big underground railway are built in sections and then sunk, instead of being dug or bored as is generally the case in this country.

The sections are made up of a steel framework on the outside, and inside they are lined with concrete to make them watertight. The upper and lateral inside portions are further covered with white enameled tiling, and the floor is paved with blocks of stone on which the track is laid. When the sections are completed, they are floated on the river and landed near the desired spot: the ground beneath them is dug out, the tunnels are allowed to sink to the desired level and are then covered up. When the sections are connected, the tube is ready for use.

THE PROTECTION OF UNDEVELOPED INVENTIONS.

By ARTHUR C. FRASER.

In every industry there arises from time to time a new invention or discovery which promises to develop into something valuable, but which is laid aside for the moment. Press of other business, difficulty in developing the invention with the materials immediately at hand, or failure to find an immediate market, may induce the temporary cessation of effort in developing the invention, notwithstanding the conviction that it contains the germ of a valuable improvement. While it is laid aside, what is to prevent another manufacturer from making the same discovery and bringing it to marketable form and securing the monopoly by a patent?

The patent laws of most countries provide that the first applicant shall be (in the absence of fraud) entitled to the patent. Our law endeavors to give the patent to the first inventor, whether he be the first applicant or not. The principle seems simple enough, but in practice there are many complications. When there are two parties claiming the same invention, an interference is declared; that is to say, a trial by the Patent Office of the question of priority of invention. The party who first made application is the senior party. That is, the presumption is that he is the first inventor, and the burden is upon the opposing or junior party to overthrow this presumption.

The crucial point is in the determination of complete invention. Invention is not completed by merely a mental conception or by a drawing or an experimental machine. The conception must be reduced to practice. That is to say, the inventor's idea must be embodied in tangible form and thereby demonstrated a practical success. Ordinarily, this is done by making and operating successfully an apparatus of suitable size for actual operation. This constitutes actual reduction to practice.

But the law is wise in providing also for a "constructive" reduction to practice. The filing of an application for patent is construed to be in every way equivalent to an actual reduction to practice. A party can thus by filing an application for patent secure his monopoly as perfectly as if he had constructed a commercial machine, and usually at a much smaller cost. This rule also works to throw out excuses sometimes offered for delay in reducing a complicated invention to practice. If an applicant alleges that his machine would have required months of time and large sums of money to complete it commercially, his opponent may reply, "you could have filed a patent application and thus completed the invention with comparatively little expenditure of time and money."

Since the actual invention is not completed until the reduction to practice (actual or constructive), it would follow that the first to reduce the invention to practice is the first inventor and is entitled to the patent. This is the general rule. And the first

to reduce the invention to practice will ordinarily prevail (even though the opposing party has already secured the patent.) unless the first inventor can be shown to have abandoned the invention after he had reduced it to practice. A delay of several years during which the machine although completed is allowed to stand idle in an obscure corner of the shop, is held to show abandonment and to deprive the inventor of the rights which his completion of the invention gave him. In this respect an application for patent is more valuable than a completed machine. It may be that the machine was laid aside because no present demand could be found for it, but preserved intact in the hope of finding a demand in future. Nevertheless, a long delay will be construed to mean an abandonment. A patent application keeps itself alive, if only it be given proper attention, practically without expense, at one year intervals. No matter how long a patent application has been pending (and some of them are kept pending from ten to fifteen years,) the inventors are perfectly secured.

One can readily see the immense legal value that attaches to promptness in the filing of an application. It is not essential that the invention be perfected to make the filing of an application possible. If you can sketch a machine which will theoretically operate according to the new conception, such a sketch may be made the basis for claims broad enough to cover any subsequent development or perfection of the same principle and constitutes ample support for a patent application. Even the drawings and description filed may be crude and informal. Yet if the principal formalities are complied with, the date of application is established and the papers can afterwards be made formally correct.

There is, however, one exception to the rule that the first to reduce the invention to practice is entitled to the patent. Where the second party to reduce the invention to practice conceived the invention prior to its conception by the first party and was not guilty of any lack of diligence in reducing the invention to practice, he will prevail over the first party. In such case, however, the proof of prior conception and of diligence must be very strong.

Therefore, if the invention does not seem to justify even the expense of a crude application for patent but, nevertheless, seems to have a possible future value, a record should be kept which can afterwards be easily and conclusively established. The best method of making such a record is by a drawing and written description explained to a few witnesses and preferably signed by such witnesses. Probably the best way to preserve such a record is to write a letter to your attorney describing the invention as fully as it has been developed and stating that it is your intention to apply for a patent for it. A working

model is better than a sketch, but it calls for more trouble and time in the making and is less easy to preserve uninjured for any length of time.

Having established conception of the invention in this way, it may be necessary also to prove that during a certain long period you did not abandon your efforts to perfect the invention or your idea of applying for a patent for it. If by your actions you should make it clear that you had abandoned any intention of proceeding in the matter, then subsequent testimony to the opposite effect would have little weight. Therefore, you should continue to assert your intention whenever occasion arises. This assertion of ownership and intention to apply for a patent is an important matter. Cases are frequently lost where an inventor, by reason of his desire for secrecy, has kept silent, when it was his duty to speak out and claim the invention.

At the best, however, mere assertion of intention to develop the invention is insufficient. The assertion must be accompanied by actual work in that direction. Diligence is absolutely essential in order to prevail over another party who first succeeds in reducing the invention to practice. What constitutes diligence depends upon the circumstances of the case. Obviously a period which might reasonably be allowed for the reducing to practice of a typewriting machine would be beyond reason in the case of an envelope or other simple invention. But here, again, the value of an application for patent is apparent. If the length of time or the amount of money required to develop an invention is excessive, and if the applicant is delayed from any of these causes in the actual reducing of the invention to practice, the question will naturally arise as to his failure to establish his claim by the comparatively simple and inexpensive method of applying for a patent.

The best course, therefore, is to file an application for patent, no matter in how crude a form the invention may be, as soon as it is conceived with sufficient definiteness to be described. The next best thing is to make a written record or a model, to have a number of witnesses who understand the details and who make a memorandum as to the date, and to place these records where they can be surely found, it may be, ten years later. This making of records, however, should be followed by a diligent effort to bring the invention to practical form, and the best evidence of such diligent effort is the filing of an application for patent.—*American Industries*.

Pumpkins for Bait.

A curious method of fishing is that of using a pumpkin as a bait. From the side opposite the stalk a small piece is cut, the seeds are taken out and the inside is filled with small hooks tied to short strings and hidden in the pumpkin pulp. The pumpkin is supported by two boards, one on each side, and is moved to the bank by a cord. Its motion tells when the fish bite.

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MECHANICAL PATENTS.

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Hoops to casks and barrels. Machine for applying bilge E. C. Thorschmidt
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Horse knee boot. Pneumatic R. C. Bever
Horseshoe calk J. T. Bell
Hose supporter E. Middleton
Hot water heater T. H. Campbell
Hub, Wheel F. F. Unckrich
Hydrocarbon burner J. McCarron et al
Ice box G. E. Lovell
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Incubator J. L. Cousins
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 Exploding mines. Wireless receiving apparatus for. F. Schneider
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 Fare box. Change giving. D. G. McKenzie
 Fastening device. F. H. Keys
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 Fat cutting machine. E. H. Bump
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 Fence bench. S. L. Bailey
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 Fire alarm. Electric. W. H. H. Everett
 Fire. Extinguishing. C. Brent
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 Floor scraper. J. Kelling
 Flue cleaner. L. C. Kleidon
 Fluid pressure brake. F. L. Clark
 Flushing tank. C. Williams
 Fly catcher. C. A. Arents
 Food compound and preparing same. Sweetened. E. D. Chaplin
 Forms. Duplicating. G. L. Anderman
 Foundry machine. W. Ebel
 Friction or massage appliance. W. Bleakley
 Fruit box. P. Henrich
 Fuel and making same. Composition of matter for. E. L. Culver
 Fuel. Consuming. E. H. Wade et al
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 Furnace fuel feeding device. Boiler. J. & W. Reagan
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 Furnace top. Blast. J. W. Gocher
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 Fuse. Electric. U. G. Rogers
 Fuse or cut out. Electric. L. B. Buchanan
 Galvanometer. J. Broich
 Game apparatus. L. J. Castonguay
 Game or toy. Race. H. Egg
 Garment. A. Berman
 Garter band. C. Bloomberg
 Gas and air burner. D. Cooley
 Gas burner. H. A. Darling
 Gas burner attachment. J. D. Sheehan
 Gas engine. J. W. Lippincott
 Gas generating apparatus. W. E. Leonard
 Gas pipe. Extensible. G. W. Thorn
 Gate opener. E. T. Morris
 Gear. Adjustable. E. T. Mathewson
 Gear. Machine. S. W. Smith et al
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 Gliding tool. W. H. Coe
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 Grinding machine. Razor blade. F. W. Blasberg
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 Hoisting machine starting device. J. D. Ihlder
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 Incubator heaters. Moisture supplying device for. C. Z. Davis
 Index rod lock. Card. P. H. Yawman
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 Ironing table. J. E. Ratcliff
 Jack. J. H. Pearson
 Journal box. W. Stevenson
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 Kick board. W. H. Nicolay
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 Sewing machines, Loop opener and spreader for C. Pedersen
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 Trowel, Plasterer's R. E. Martin
 Truck equalizing device Car A. E. Ostrander
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 Vehicle, Motor R. Herman
 Vehicle spring attachment J. H. Sager
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 Wagon jack H. G. Cady
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 Wall tie F. Weber
 Walls, &c. Facing for A. O. Whitney et al
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 Water supply and drainage apparatus P. M. Nevins et al
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 Display booth M. A. Singer
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 Control system R. P. Jackson
 Converter system, Rotary W. S. Rugg
 Conveyor E. H. Spear
 Conveyor L. C. Kylo
 Conveyor system J. H. Shay
 Conveying apparatus G. A. Amsden
 Cooker for oil bearing meal and the like, Steam A. W. French
 Cooker, Fruit M. F. Holbrook
 Cooler H. T. Thomas
 Corn cap W. E. Klokke
 Corn husker and fodder shredder J. R. Hall
 Corn husking machine J. W. Paige
 Corn protector L. C. Hasselman et al
 Corn shocking machine, 2 pats. D. W. Smith
 Corset, Abdominal M. M. Downer et al
 Cotton and corn stalk cutter G. R. Robinson
 Cranberry scoop or picker G. W. Griswold
 Crank shaft J. Poehner
 Crate T. G. Wilson
 Crib, Collapsible C. E. Raymond
 Crosstie Metal G. R. James
 Cultivator W. M. Ashmore
 Cultivator, Cotton R. H. Purnell
 Cultivator replanting attachment M. F. Hodges
 Cultivator shove or tooth, C. Burmeister et al
 Current interrupter, Electrical F. W. Lord et al
 Current machine on single phase circuit, Alternating R. D. Mershon
 Current machinery, Alternating A. S. McAllister
 Current, Method of and apparatus for transforming single or polyphased into continuous G. Faget
 Current motor J. Kirschweg
 Curtain support W. Luft
 Cutting wire W. R. Cunningham
 Decorticating machine 2 pats. C. N. Davis
 Dental appliance C. M. Dowell
 Dental tool handle J. Bode
 Desk W. Gaikema
 Detinning process F. von Kugelgen et al
 Dial ornamenting machine E. A. Marsh
 Display rack E. D. Harding
 Display shelving R. T. Joyce
 Distillation, Process of J. N. Watt
 Distilling coal O. A. Gobbe
 Ditching machine W. Umstead
 Door C. A. Glocker
 Door check and closer J. Bardsley et al
 Door closer and check, Combined W. N. Amsbury
 Door, Grain G. W. Kellogg
 Door opener, Electric J. Lock
 Door spring and stop A. C. Wyman
 Doubletree attachment J. F. Butterfield
 Draft apparatus G. M. Sommer
 Draft appliance R. Leitz
 Draft equalizer A. Kndle
 Drag G. E. Ketchum
 Drapery supporting device C. Levy
 Drawer stop W. L. Tnell et al
 Drawers, Apparel H. P. Wheeler
 Drawing instrument H. Mettler
 Dressing device, Rotary V. Spietschka
 Dry battery C. D. Manville
 Dry pan crusher J. W. Bolts
 Drill D. B. Edwards
 Drilling machine E. Westberg
 Dust deflector J. L. Replogle et al
 Dye of the quinophthalone series and making same, Yellow sulfon A. Bertschmann
 Elastic comb M. Hess
 Electric cables, Drying W. B. Hale
 Electric circuit controller, Hand operated R. P. Jackson
 Electric circuit switch, Automatic C. H. Hill
 Electric conductor supporting device B. J. Jones
 Electric elevator H. F. Gurney
 Electric furnace H. N. Potter
 Electric motor and other apparatus in which there is magnetic flux R. D. Mershon
 Electric motor controller C. A. Dresser
 Electric motor controlling apparatus R. P. Jackson
 Electrical systems from lightning and other static disturbances, Protection of R. D. Mershon
 Electrically controlled elevator W. D. Lutz

- Electrically controlled elevator C. & F. C. Nijjoks
Electromagnet R. P. Jackson
Electromagnetic separator W. Blackmore
Electrotherapeutic instrument J. W. Mollere
Elevator control device, Automatic 2 pats. S. S. Teague
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Elevator safety means M. T. Weston
Elevator safety stop J. N. Mitchell
Engine D. A. Seyler, Jr.
Engine cylinder, Explosive J. W. Bigsby et al
Engines, Fair lead for donkey H. Holmes
Excavating machine bucket C. C. Jacobs
Excavator W. R. Martin
Exercising apparatus, Electric A. B. McMillan
Expanding bit A. E. Swanson
Explosive 2 pats. F. Sparre
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Extension table M. L. Bowman
Fan attachment for sewing machines and the like J. P. Coleman
Fan attachment, Motor B. Fesemaler, Jr.
Fan, Rotary J. W. Harding
Faucet, Self closing W. M. Bashlin
Feed box for poultry F. G. Allen
Feed water strainer for locomotives A. C. Bottger
Feeder, Automatic boiler J. H. Murray
Fence clip, Wire M. Howard
Fence machine, Wire I. N. Morford
Fence post and fastening device therefor, Metallic R. Mattice
Fence, Wire C. Henderson
File, Letter J. J. Dettwyler-Bruderslin
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Fire box and grate, Adjustable E. A. Probst
Fire escape F. J. Bryant
Fire extinguisher C. E. Buell
Fire extinguisher H. Mikorey
Firearm sight G. H. Conrad
Firearm sight G. E. Albee
Fireproof building construction C. Collins
Fishing reel W. E. Marhoff
Flax treating apparatus F. H. Richards
Flexible wheel E. Wigglesworth
Floor construction J. Kshu
Floor waxing machine C. B. Wattles
Flooring J. McLartyre
Flue joint structure A. Leggett
Flue support W. L. Williamson
Fluid pressure controlling device G. H. Gilman
Flux C. Ellis
Flying machine M. Nial
Flying machine B. Connolly
Folding machine delivery mechanism S. Wheeler
Foot power machines, Device for promoting the impetus of A. J. Pierce
Fruit gatherer A. A. Smith
Fruit jar G. F. Wellhouse
Furnace J. F. Monnot
Furnace rail M. Sklovsky
Fuse holder J. C. Ralls
Fuse terminal, Safety J. Sachs
Game apparatus W. J. Thomas
Game appliance W. H. C. D. Charity et al
Garment supporter F. L. De Graff
Gas cut off, Automatic R. K. Stevens
Gas generator, Acetylene L. Pederson
Gas generator, Acetylene J. T. Kittredge
Gas igniter, Electric F. C. Nickel et al
Gas producer C. L. Huston
Gas producing and heat generating process A. E. Johnson
Gas producing apparatus G. Marconnet
Gas regulator D. P. Skelldinger
Gate A. Hendrich
Gear, Changeable drive J. Weichmann
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Girth J. W. Gardner
Glass and show cases, Fastening for plate C. M. Conley
Glass articles, Shaping W. E. Bock
Glass delivering apparatus, Molten R. S. Pease
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Glass making apparatus R. S. Pease
Glass making wire R. A. B. Walsh
Glass shaping machine W. E. Bock
Glass shaping machines, Mold for W. E. Bock
Gluing machine J. Alger
Go-cart body W. A. Marqua
Goods handler E. E. Welch
Governing means for internal combustion engines R. Hennig
Grab hook A. W. Robinson
Grain binder M. Mollitor
Grain separators, Distributor for M. L. Barbeau
Gravel spreader and road leveler D. M. Trabue
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Guns, Cartridge deflector for top ejection W. Bennett
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Guns, Telescope attachment for T. C. Johnson
Hair drier C. S. Mason
Hammer, Drop G. B. Lamb et al
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Harrow J. C. Ferguson
Harrow riding attachment G. Hulsman
Harvester attachment A. G. Bestgen
Harvester cutting apparatus, Corn W. H. Tilson
Hat dipping apparatus A. W. Hilsinger
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Hay and stock rack D. L. Ryder
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Hay loading machine F. E. Fox
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Head rest B. K. Ackley
Headlight M. E. Fuld
Heating furnace L. A. Fisk
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Hoe and rake handle O. Stewart
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Hose clamp H. E. Crandall
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Jar wrench W. H. Macy et al
Joint plate L. W. Kershaw
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Journal box lid L. Y. Williams et al
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Knockdown box T. Wertz
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Lacing terminal fastener F. H. Steiniger
Lacings, Machine for manufacturing shoe or similar W. H. Church
Lactose from glucose, Making J. A. Just
Ladder, Folding N. Schaefer
Lamp burner J. A. Mosher
Lamp support, Incandescent E. Beaudette
Last W. E. Trufant
Latch, Gate S. S. Rector
Lawn trimmer S. O. Sawyer
Lead oxid, Making C. A. Hall
Leather, Coloring W. M. Norris
Leather skiving machine P. J. Lapham
Letter case W. A. Tilley
Level and inclinometer, Gravity plumb C. B. Watts
Leveling device H. Brown
Life lines, Means for projecting and anchoring A. Meyer et al
Lifting apparatus L. O. Beaudet
Lighting, Vacuum tube D. M. Moore
Line locking mechanism A. Schaefer
Liquid, Means for delivering measured quantities of R. P. Park
Liquid purifying apparatus C. Schmidt
Load binder 2 pats. A. U. Cox
Loading device J. W. Pim
Lock C. E. Scribner
Locking device for containing cases E. B. Craft
Locomotive, Gathering J. M. Roan
Log turner D. A. Kennedy
Log types, Producing P. T. Dodge
Loom shuttle H. W. Bracken
Loom shuttle C. Aillery
Loom with sliding front plate for the shuttle box, Automatic shuttle changing E. S. Stimpson
Lubricator C. F. Schroyer
Lubricator A. Byington
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Mail receiving box A. Haentze
Manure spreader F. M. Goodhue
Marker C. Beckmann
Marker, Land A. E. Le Blanc
Massage implement L. B. Buchanan
Watch making machine J. H. Weaver et al
Measuring attachment for bottle stoppers A. Morrison
Measuring instrument, Electrical A. O. Benecke
Metal bodies, Making compound J. F. Monnot
Metal coating apparatus J. F. Monnot
Metal converting apparatus R. L. Lloyd
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Milk and cream pasteurizer and cooler, Combined J. L. Ahlers
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Milling machine W. Porteous
Mixing machine B. S. Blake et al
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Mower J. H. Sherrard
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Musical compositions, Reproducing H. P. Ball
Musical instrument player, Pneumatic G. P. Brand
Musical instruments, Mechanism for making master sheets of H. N. Cross
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Oiling device for feed grinders L. B. McCargar
Ore mill J. H. Johnson
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Package, Fabric shipping W. L. Penney
Packing, Metallic C. C. Hageman
Padlock, Permutation M. J. O'Leary
Pan lid W. C. Vernon
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Paper cutter for duplex shell machines J. Chesney
Paper holder and cutter, Roll C. H. Patterson
Paper pattern G. M. Laub
Paper perforating or impressing machine C. Carlton
Peat carbonizing apparatus H. J. Wickham
Pebble mill lining M. F. Abbe
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Peroxide, Forming monobasic organic A. C. Houghton
Phosphate, Producing dicalcium 2 pats. E. Bergmann
Photographic films, Producing picture copies by means of transfer C. Pietner
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Pipe coupling sealing device H. F. Gray
Pipe coupling, Train J. A. Frenzel
Pipe cutter P. McGregor
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Pipe winding machine J. S. F. Marks
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Plow handle or regulator W. N. Thorntom
Plow jointer R. C. Smith
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Pocket Safety E. Shaw
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Potential regulator W. H. Thompson
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Press bar locking device P. E. Wirt
Pressure equalizer F. E. Whitney
Printing blocks and plates, Manufacturing L. Collard
Printing press front or feed guide G. P. Fenner
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Printing presses, Perforating or scoring device for C. E. Burch
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Pulley J. A. Kaplan
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Pump regulator, Condenser R. Wikander
Pump, Rotary R. P. Christensen
Pumping, Deep oil well R. J. Hoffman
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Rail joint L. Boudreaux
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Railway, Pleasure R. Hunt
Railway semaphore signal, H. M. Abernethy
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Railway tie J. Campbell
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Range finder, Depression A. Swayse
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Refrigerator distributor W. Wolf
Relay E. F. Bliss
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Ride, Magazine E. E. Redfield
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Rotary engine J. A. Kray
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Runway or guide L. J. Harris
Sack holder H. F. Henke
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Safe A. F. Gustafson
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Seal lock A. Boal
Sealing and stamping machine, Letter J. N. Stacy
Sectional mold T. C. Steimer
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Semaphore signal, Electrically controlled H. M. Abernethy
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Shipping case C. O. Wright
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Sink strainer N. Lake
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Skirt and garment marking device J. M. Beare
Skirt supporter and waist stay C. D. Fletcher
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Smoking device G. A. Pfortner
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Spark indicator, Jump O. C. Hoffmann
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Spinning and twisting machine C. E. Lombard
Spinning or twisting apparatus, Ring G. W. Knight
Police caller M. R. Moloney
Splice or angle bar E. C. Seward
Solids, Apparatus for applying composition to F. C. Dillany
Spraying device E. F. Kauffman
Spring motor L. J. Ring
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Stair, Metallic S. Grossman
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Stone puller A. Deschambault
Stonesaw hanger, Pendulum F. A. Daley
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Stove lids and plates, Closure for lifter openings for H. L. Sheldon
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Switch mechanism T. Rufford
Switch mechanism, Electric 2 pats. F. C. Newell
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Telegraph receiving system, Wireless L. De Forest
Telephone exchange system J. A. Aven
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Telephone switch T. S. Mount
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Tent and hammock support J. M. Fyfe
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Tie plate H. H. Hart
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Tie machine C. L. Baldwin
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Tire for wheels, Elastic W. R. Smith
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Tire valves and the like, Manufacture of dust caps for M. C. Schweinert et al
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Tool, Adjustable R. T. Johnston
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Toy railway vehicles, Means for stopping and releasing E. Solmann
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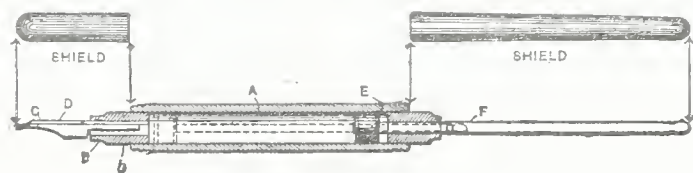
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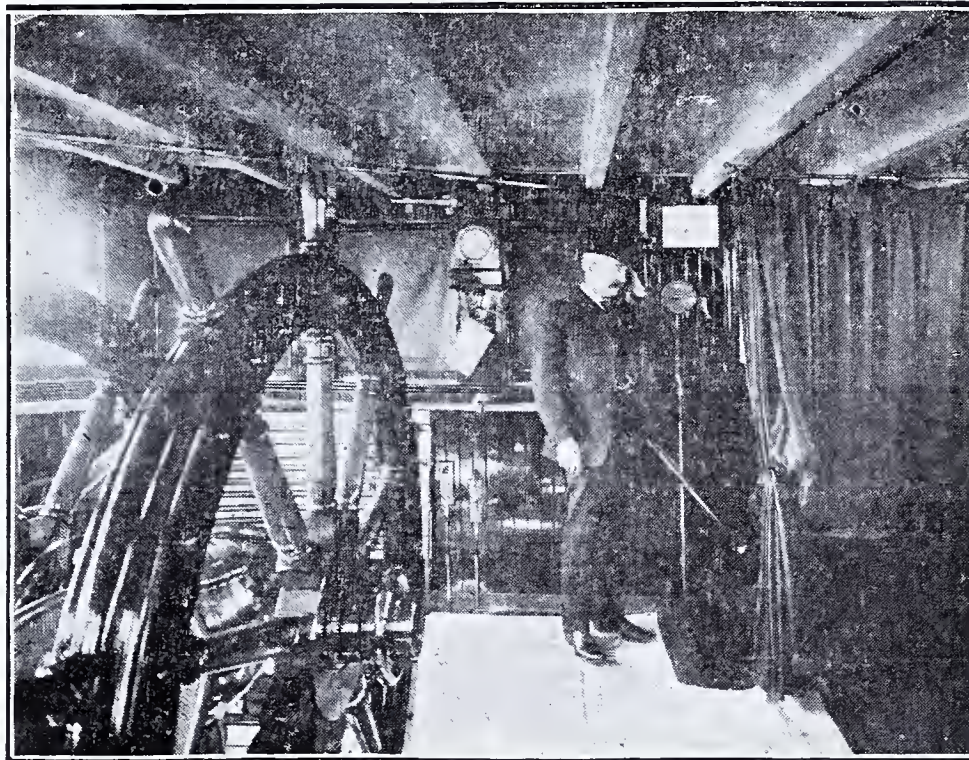
MODERN SUBMARINE SIGNALLING.

By FRANK C. PERKINS.

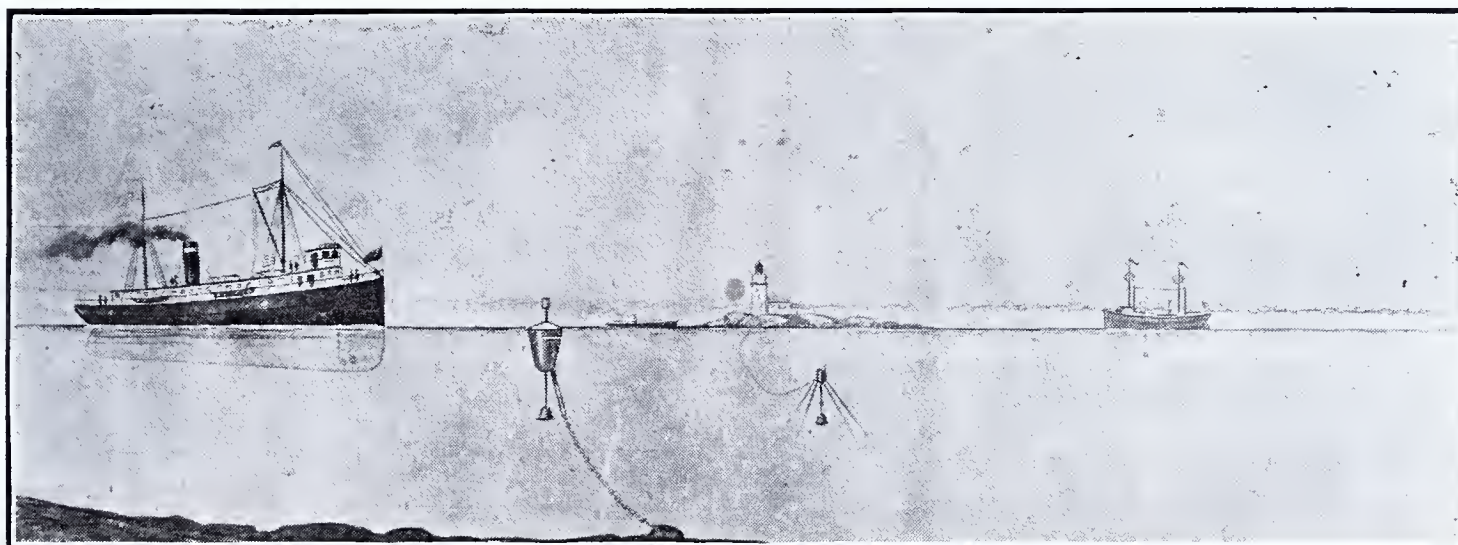
THE accompanying illustration shows the latest and most unique type of submarine signalling apparatus which is of more than passing interest to motor boat, launch, and yacht owners, as well as the largest ocean and lake steamers. This system of signalling by sound under water enables seamen to locate the position of their ships, to find the bearings of buoys, lighthouses and light ships when the weather conditions prevent observation. By its aid a vessel can enter a harbor safely in a fog, and need not be delayed because her captain cannot see lights or hear other fog signals.

The signalling apparatus is adapted to produce sounds in the water, and this may be a fixed station, as a buoy or lightship or a moving vessel, while the receiving apparatus is usually located on a ship and enables the navigator to hear the signals and determine the direction from which they come.

The signalling apparatus takes different forms, according to the various requirements of service. For instance, stationary fog signals for warning vessels from dangerous rocks or shoals or guiding them into safe channels, the signalling device is generally a submerged bell of peculiar design adapted to produce sounds of long range under water. The bell is rung by striking it with a clapper, making distinct strokes separated by intervals of silence, and the length of the intervals may be so varied as to make the bell strike a number after the manner of a fire alarm bell, which number serves to identify the location. Such bells in diameter from fifteen inches to



SUBMARINE SIGNALLING APPARATUS IN PILOT HOUSE



SHOWING SHIP FILLED WITH RECEIVER.

eighteen have a practical range under water of five or six miles, and have been heard as far as fifteen miles.

As shown in the accompanying illustration, the submarine bell in one of its applications is hung in the water from a light ship and operated at will

by automatic machinery under the control of men on the ship, in a way similar to the operation of the fog horn. In another it is suspended from a buoy, and rung automatically by the motion of the waves. In a third it is rigidly supported on the bottom of

the same and connected by an electric cable to a lighthouse or other station on shore. A small submarine bell may be carried in a fisherman's dory, and when hung over the side will be rung automatically by the rocking of the boat. The schooner equipped with receiving apparatus can then find the dory if it should be lost in a fog.

When submarine communication between ships in motion is desired, a sound of a different character from the stationary submarine fog signals is employed in order that there may be no possible confusion; such for example as sometimes leads to disaster in the case of sound signals in the air, when a fog horn is mistaken for the whistle of a steamer. For this purpose specially designed submerged bells are employed.

When sending signals from a ship in motion, the sound producing device is inside the hull of the vessel and may be operated either by automatic machinery or by hand.

It may be stated that the sound-receiving apparatus as applied to vessels comprises the transmitters, or, as they may be called, the ears of the ship located inside the hull below the water line; the receiving telephones and the direction indicator which are placed usually in the pilot house.

It may be of interest to note the arrangement of the transmitters. In the forehold are placed a pair of small tanks, each about

as large as a good sized iron kettle. They are fastened one on the port side and one on the starboard side, below the water line, with the open mouth of the tank against the outer plating or planking of the ship, so that the side of the ship makes one side of the tank.

A gasket is used to make the joint between the tank and the side of the ship very tight, a small opening at the top of the tank allows it to be filled with a dense liquid. Through the cover which closes this opening is hung the microphone or electric sound receiver, having a round brass case about the size of a watch, which is suspended in the liquid of the tank. This method of applying the sound receivers requires nothing projecting on the outside of the vessel; the apparatus is wholly inside the hull, there being no cutting through, or connection with the outside water and the liquid in the tanks.

It is stated that the sound of the submarine bell passes from the outer water through the wall of the ship, into the liquid in the tank, where it affects the microphone in the same way as an ordinary telephone transmitter is affected by the sound of the voice. The microphones in the port and starboard tanks respectively are connected by wires through a battery, to the direction indicator.

connected with the receiving telephones. It has also a dial which shows to which side the telephones are connected; and inside is a small electric lamp, which may be turned on at night, if necessary, to see the dial.

The receiving telephones are similar to the common telephone ear piece and are hung on hooks, one on either side of the direction indicator. They are also connected together, either to the port or the starboard transmitter according to the position of the switch. Either of the telephones may be used alone to listen to the submarine bell, or when the noise is faint and it is desired to shut out other noises both may be used, one held to each ear.

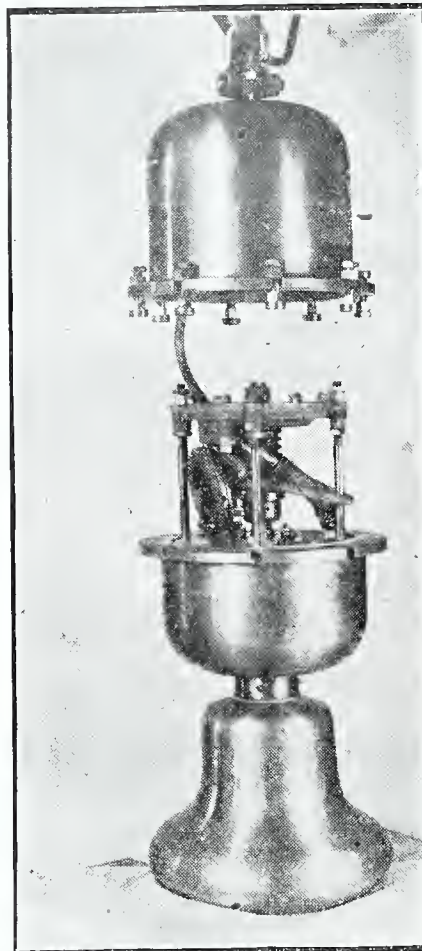
The pilot can hear the sound of the submarine bell as received either on the port or the starboard side of the ship by holding the telephone to his ear and turning the indicator switch to connect with either the port or starboard microphones. The sound is always heard louder on the side of the vessel toward the bell.

In order to point the ship exactly at

compass and the vessel's course laid accordingly.

Two pairs of microphones are provided—each pair comprising a port and

appalling loss of life and property every year by ship wrecks, the majority of which are due to the navigators losing their bearings in a fog.



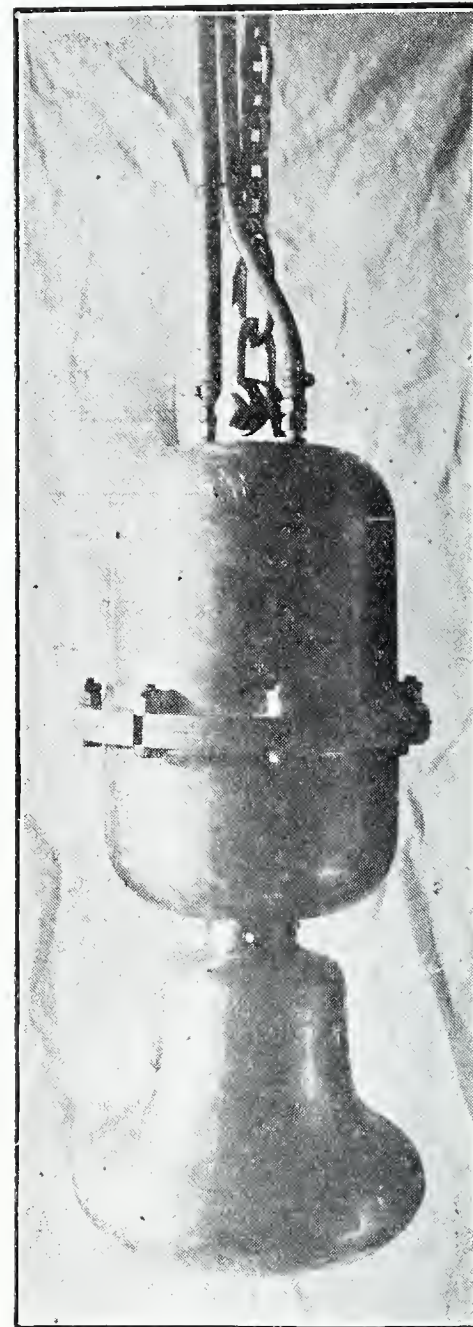
DIAPHRAM STRIKER OPEN.

a starboard microphone, either pair being put in service by shifting a special switch on the direction indicator. Either pair may be used independently to determine the direction of the bell, and the indication of one set, checked by comparison with the other.

It is stated that the degree of accuracy with which the bell can be located after a little practice, is surprising. Some navigators claim to do it within one eighth of a point of the compass, and a novice can learn in five minutes to find it with sufficient accuracy for practical purposes.

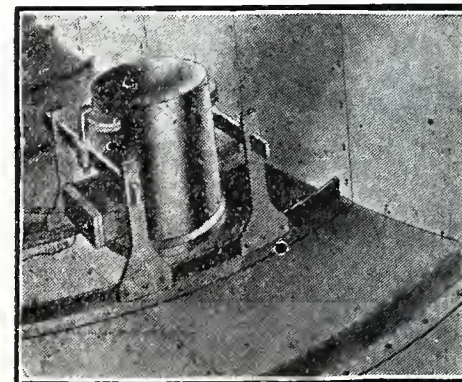
It is easy to understand the reasons why submarine sound signals are preferred to other types of fog signals. Before this method of signalling under water was introduced, the only way ships could locate their position in fog was by means of sound signals in the air. These signals have consisted of bells, whistles, and the like, and their extreme unreliability is well known to mariners. There are days when a bell or horn will be heard seven or eight miles at sea, and other days when there is a strong wind blowing toward the shore that it cannot be heard half a mile. There are instances where steamers have actually run into light ships, the lookout being unable to see the light, or hear the whistle, until too close to avoid the collision.

It may be stated that signals in the air are subject not only to interference by the wind, but to the freaks of echoes, silent spaces and the drowning of the signals by other noises, which make it frequently impossible to locate accurately the sound when heard. The unreliability of the ordinary fog-signal is attested by the



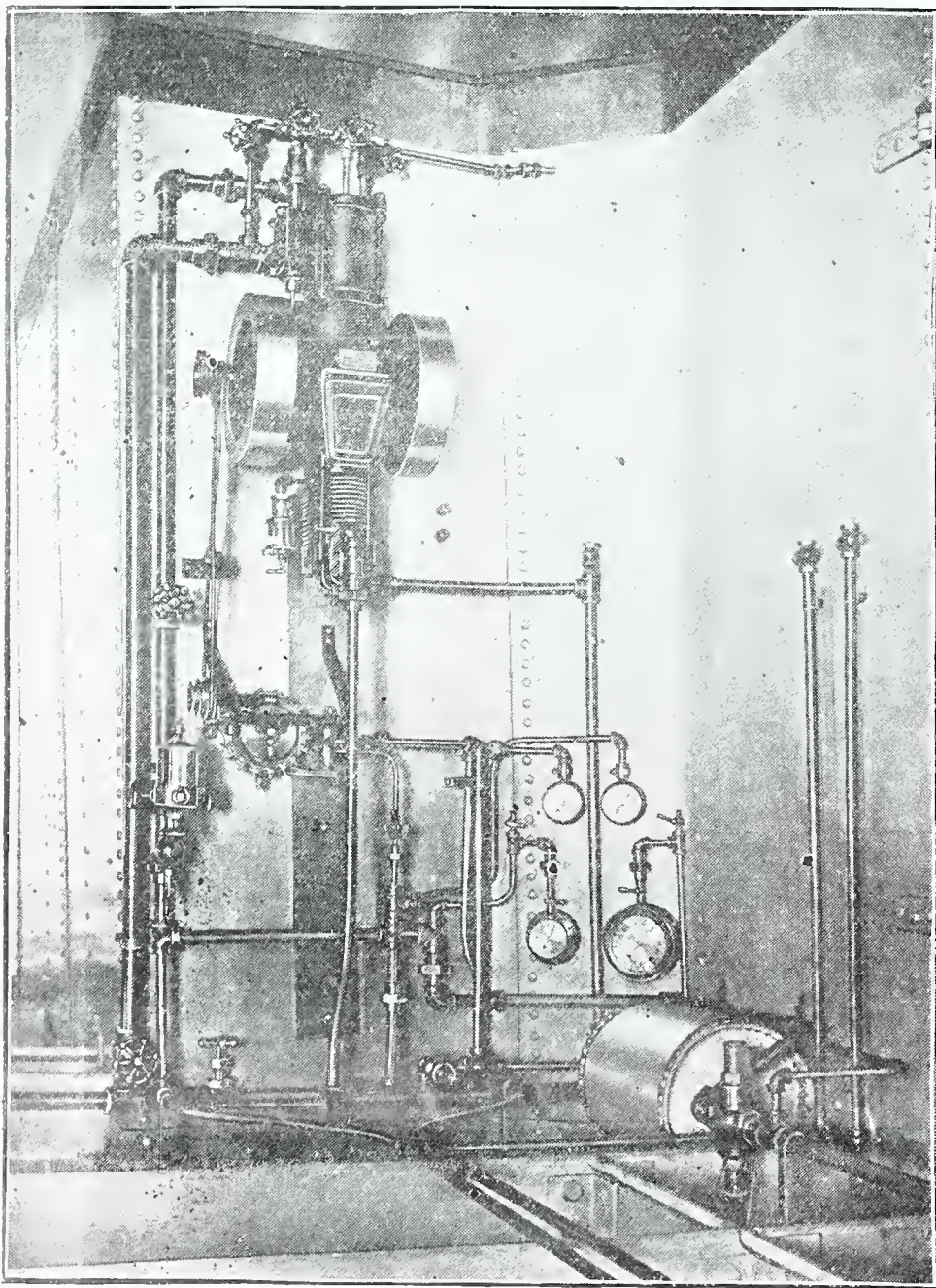
SUBMARINE SIGNAL BELL CLOSED.

There is no doubt of the superior reliability of submarine signals as the water, being a better conductor of sound than the air, is not subject to the same variable conditions. Sea water is of practically uniform density at all depths. The velocity of sound in water is more than fourfold its velocity in air, the distance being about 1100 feet per second in air and 4700 feet in water; and the range of signals in the water is correspond-



TRANSMITTER FOR HOLD OF SHIP.

ingly greater. On the other hand, the velocity of the tidal currents in the ocean is very much less than the velocity of the wind above its surface, which in storms frequently reaches 30 miles per hour. Below the surface of



SHOWING PIPING ON BOARD LIGHT SHIP WITH AIR COMPRESSOR. CODE WHEEL WHICH STRIKES ANY NUMBER DESIRED.

The direction indicator is a round metallic case, about 9 inches in diameter, shaped like a ship's clock, and fastened in the same way to the wall of the pilot house or the chart room. It may be placed on the bridge if desired. On its face is a switch, by means of which either the port or starboard microphone can be con-

ected with the receiving telephones. It has also a dial which shows to which side the telephones are connected; and inside is a small electric lamp, which may be turned on at night, if necessary, to see the dial. The receiving telephones are similar to the common telephone ear piece and are hung on hooks, one on either side of the direction indicator. They are also connected together, either to the port or the starboard transmitter according to the position of the switch. Either of the telephones may be used alone to listen to the submarine bell, or when the noise is faint and it is desired to shut out other noises both may be used, one held to each ear. The pilot can hear the sound of the submarine bell as received either on the port or the starboard side of the ship by holding the telephone to his ear and turning the indicator switch to connect with either the port or starboard microphones. The sound is always heard louder on the side of the vessel toward the bell. In order to point the ship exactly at

the sea there is practically no noise to conflict with the note of the signal bell, and abundant experience has proved that it can be heard and located as well during the most violent storm as in calm weather.

It is claimed that submarine signals do not interfere with the use of other existing fog signals. The same steam or air pressure that blows the whistle on a light ship will also ring the submarine bell; and the power used for the latter amounts to so little compared to what the whistle consumes as to hardly be perceptible in the quantity of coal burned.

It is stated that the same buoy actuated by wave-motion can ring a submarine bell and a bell in the air simultaneously; and a submarine bell can be attached to a whistling buoy without interfering with the operation of the whistle. As long as atmospheric sound signals are to be used together with submarine signals, such combination buoys are a great economy in avoiding the duplication of buoys in the same station.

It is also held that a submarine bell may be attached to a Wilson automatic gas-lighted and whistling buoy. This buoy is charged with calcium carbide placed in a grating in a central compartment, one charge supplying acetylene gas at a low pressure in sufficient quantity to maintain a brilliant oculating light for six months or more. The light is carried about 30 feet above the surface of the sea, and just below the lantern, is a whistle sounded by air forced through it by the motion on the water in the two long air-compressing tubes extending downward from the buoy. Joining these tubes at their lower end is a cylindrical case containing the automatic, wave-operated mechanism for ringing the submarine bell.

It is claimed that this combination buoy is the most complete and wholly efficient automatic marine signalling apparatus in existence. Anchored in exposed situations of dangerous shoals, or outside the entrances of harbors, it shows a flashing light superior to that of the average light-ship, and sounds a fog whistle, besides sounding the submarine signal by means of which vessels equipped with receiving apparatus can accurately locate it miles away in the thickest weather.

Wireless.

Wireless transmission of electricity is employed not only for telegraphic and telephonic messages, but for other purposes. Prof. Bell, the electrical expert, has succeeded in operating a motor in a flying machine by means of wireless; and incandescent bulbs have also been lighted by the same method. A Connecticut man recently with a crude apparatus lit a 25 candle power lamp which was 50 feet away from the battery. No commercial value is yet to be derived from the process, but it is the first step in this direction, and with improvements in apparatus many things now undreamed of may be accomplished by wireless.

FIRELESS COOK STOVES.

A new article of kitchen furniture is the hay box, or fireless stove. Every housewife knows that a pot of coffee can be kept hot for a long time by wrapping it securely in a dry towel to prevent the escape of heat. It seems strange that the world has been so slow to make a more extended use of this idea. Such a box would be of great advantage in any household, and for working women, who are obliged to leave their homes for the entire day, it would be invaluable to find dinner cooked on their return.

The fireless stove is simply a box lined with hay—almost any box with a tight cover will do. It can easily be made at home. The wood should not be too thin, and there must be no cracks or knot holes. Old trunks might be successfully utilized in this way. The box should be loosely filled with hay, or shavings, or paper may be substituted if hay is not available. The stuffing should be renewed every two or three weeks. A number of nests are arranged in the hay, and when the pots containing the food are placed in these nests, the hay should be packed under and around them tightly. Any kind of pots can be used, though earthen ones hold the heat best. The tighter the tops the better, but if the food is to be used within six or eight hours, it is not necessary that the pots should be of a kind which can be hermetically closed. When they have been placed in the box—carefully, and without lifting the lids—they should be covered with a pillow and the lid of the box at once securely closed.

A few minutes preliminary cooking is necessary for the articles of food, and a little experiment will show how much is required for different substances. In general, it will be found that two or three minutes of actual boiling on the fire is amply sufficient for vegetables, while roasted meat requires half an hour. Most articles should remain tightly closed in the box from two to three hours, though they can be left there to keep hot for ten or twelve hours, if desired.

The box not only keeps the food warm, but continues the process of cooking. It cannot of course be used for beefsteaks, cutlets, pancakes, etc., whose chief attraction lies in the crispness resulting from rapid cooking on a hot fire, but when food of this kind is being prepared, it is a comfort to the housewife to know that the rest of the meal is ready and hot in the box.

Science teaches that many substances become ready for use as food at temperatures below the boiling point; and that, unless the pots are hermetically closed, a temperature exceeding 212° F cannot be attained, no matter how much fuel is consumed nor how long the boiling is continued. Accordingly, the object to be kept chiefly in view is to retain the heat as long as possible when it has once been developed.

This fireless stove, which was first brought to public attention in the United States through the medium of

a consular report from Germany, bids fair to be adopted in our army. The Commissary General of the War Department ordered tests to be made with it, and an interesting series of experiments was carried out at the school for bakers for the army at Fort Riley, Kansas.

It is mentioned, among other articles, that half a pound of rice was placed in a lard can, boiled five minutes, and put in the hay box for two and a quarter hours. It was perfectly done when taken out. Macaroni with tomatoes, boiled 5 minutes, was placed in the box for one hour and ten minutes. On being removed, it was found to be better cooked than on a stove. Beans, soaked over night and boiled 6 minutes, were placed in the box for two hours. They were thoroughly done and ready to be placed on the table. The report adds that the chief of the school intends to make a box lined with powdered cork and corrugated paper, which it is thought will prove effective owing to their nonconductive property, the cork especially. This could be placed in an escort wagon for field service or garrison use. It is believed that the box will be extremely useful in the field, as food can be cooked a short time before breaking camp and then placed in one of these boxes, to be removed ready for consumption at the end of the day's march. The expense of making the boxes is slight, and it would not only save fuel, but afford means for properly serving a variety of food to troops.

When not in use, the box should always be left open and the hay loosened, the pillow being hung in the air to dry thoroughly.

The chief advantages of the box may be summarized as follows:

1. The cost of fuel can be reduced four-fifths, or even nine-tenths.
2. The pots are not made difficult to wash: they are not blackened, and they will last for an almost indefinite period of time.
3. The food is better cooked, more tasty, more nutritious, and more digestible.
4. Kitchen odors are obviated.
5. Time and labor are saved.
6. There is no need of stirring nor fear of scorching or burning.
7. The cares of the housewife are lessened, and her health and happiness are thus protected.
8. The kitchen need not be in disorder half of the day.
9. Warm water can always be had when there is illness in the house and during the summer when fires are not kept up.
10. Milk for the baby can be kept warm all night in a pot of water.
11. Where workmen's families live crowded in one or two rooms the additional suffering caused by kitchen heat is obviated by the hay box, for the preliminary cooking can all be done in the cool of the morning.
12. At picnics the appetites of young people are only half satisfied by sandwiches and other cold food. The hay box can furnish a hot meal anywhere and at any time.
13. Similarly, men and women work-

ing in the fields or having night employment can take with them hot coffee, soup, or an entire meal thus avoiding the necessity of returning home at a fixed hour or having it brought to them by another member of the family.

14. When different employment make it necessary for the various members of a family to take their meals at different hours, this can be arranged without a multiplication of work with the assistance of the hay box.

Measuring the Distance of Objects.

A French naval officer has devised a little instrument by the aid of which the distance of any visible object of which the height is known, can be obtained accurately, without resorting to elaborate calculations. The instrument works on the principle of a combination of two prismatic rings, so adjusted as to give a variable refractive angle, so that the user, by means of a graduated scale, may read off the distance of the object regarded without stopping for mathematical calculation.

Letter Registering Machine.

An automatic machine for the posting of registered letters has been invented in Austria, according to our Consul at Prague. This apparatus, which makes it possible to post registered letters without the assistance of postal officials, is said to have been accepted by the French and Hungarian governments. At a recent demonstration, in the presence of the postal authorities, the device worked successfully, and some machines are to be put up shortly to test the practical value of the invention.

Swimming Machines.

A Frenchman has devised an application of the gasoline motor which is intended to aid in swimming. The motor is enclosed in a waterproof casing which is held on the surface by air bags. The whole is strapped to the back of the swimmer, and when the propeller is started he is driven through the water at much greater speed than he could attain by his own exertions. The same inventor has evolved an automatic skating device, on which one has only to stand erect and be borne wherever he wishes.

Another swimming device is due to the ingenuity of an American. It consists of a float of aluminum, about the length of the human body, on which the swimmer lies. Propelling machinery is supported by floats, and the screw propeller is set in motion by pedals fastened to the operator's feet, which work in the same manner as bicycle pedals. The swimmer steers by means of his arms, and for each revolution of the pedal shaft the apparatus (which weighs 25 pounds) is carried forward about 3 feet.

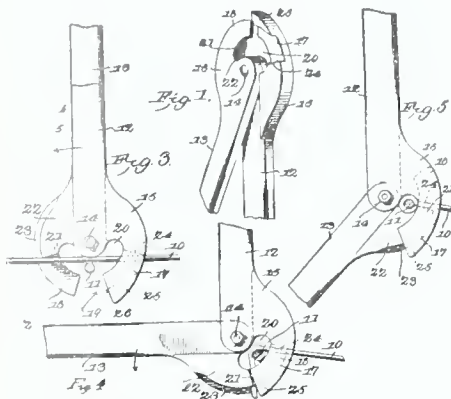
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CLEVER NEW PATENTS.

Wire Working Tool.—Cement Block Structure.—Rotary Engine.—Wheel Flange for Oil Well Rigs.—Neck Yoke Center.

Wire Working Tool.

Mr. Jonas F. Dixon, of Carthage, Mo., has obtained a patent on a wire working tool, which, while adapted for a large variety of purposes is particularly useful in bending the cross wires around the side rods of spring beds, and at the same time clips the superfluous end of the wire while being bent. In the preferred form of construction, the tool comprises handles 12 and 13 pivoted together and provided respectively with jaw members 15 and 16. These jaw members form approximately a circle with an aperture 19 at the side opposite the handle communicating with an opening 20. The jaw 16 is provided with a shoulder 21 supported by an offset portion 22 positioned to leave a furrow 23 adjacent to the periphery of the jaw. The jaw 15 is also provided with a shoulder 24 upon the side opposite the shoulder 21, and at approximately a diametrical point thereto. At the end of the finger 17, a lug 25 is formed, and so positioned that it passes circumferentially past the finger 18, the inner corner 26 cooperating in a shearing engagement with the exterior corner of the shoulder 21 when the handles are separated continues in the groove 23.

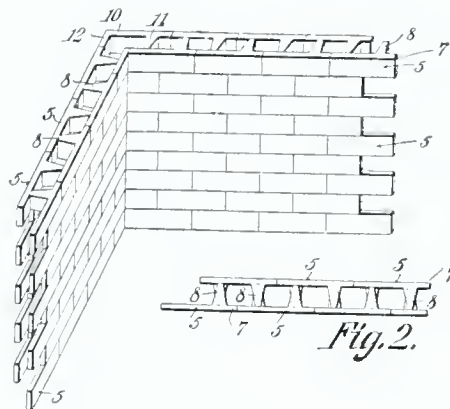


In operation, the tool is placed upon the work by embracing the side rod 11 of the spring within the opening 20, and with the cross wire 10 of the spring in contact with the inner surfaces of the fingers 17 and 18, and with the shoulders 21 and 24 as shown in Figure 3. The handle 13 is then moved about the pivot 14 in the direction of the arrow, the fingers enclosing the rod 11 and the shoulders bending the wire to the position shown in Figure 4 when it is engaged between the shoulder 21 and the corner 26 of the lug 25, and is clipped at that point. The continued movement of the handle 13 carries the end about the rod 11 to the position shown in Figure 5, the operation being thereby completed.

Cement Block Wall Structure.

A novel building wall constructed of concrete blocks has been patented by Mr. Simeon Crittenden of Chatfield, Minnesota. His object is to provide a strong, durable wall having a plurality of air flues extending vertically therethrough to prevent frost

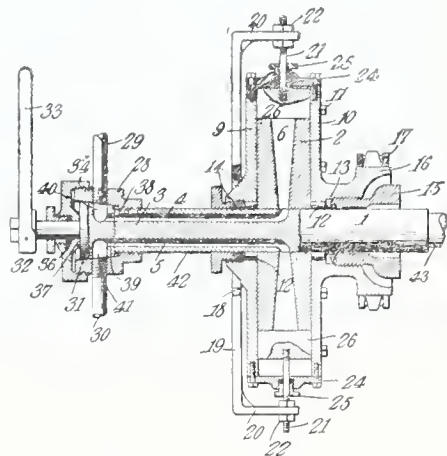
and moisture from penetrating to the inner face of the wall and thereby injuring the plaster. A plurality of side blocks are employed, each consisting of a substantially rectangular body portion provided with a single wedge shaped projection that extends laterally from the inner face of the block at one side of the center thereof, and bears against the opposite inner face of the opposing block. The corner blocks have spaced lateral projections of equal length, one of which is wedge-shaped and of the same size as the projection of the side blocks,



while the other is disposed flush with the adjacent end of the corner block and of a uniform width throughout its entire length. These blocks are laid in superimposed courses and arranged to break-joint, with the projections of the side blocks in one course bearing against the inner faces of the opposite blocks in the same course and overlapping the projections of the blocks in succeeding courses. The terminal projections of the corner blocks are abutted against the adjacent ends of the side blocks in the same course.

Rotary Engine.

Mr. Lucas K. Sivertson of Willow City, N. D., has obtained a patent on a rotary engine which employs a rotary casing and a stationary piston. A stationary shaft is employed having longitudinal steam passages 4 and 5 therein. An eccentric piston head 2 is secured against movement to the shaft, and has steam passages 6 and 12 that communicate respectively with the passages 4 and 5. These passages open through the periphery of the piston head. A rotary casing 9 10 encloses the piston head and is mounted concentrically on the shaft. Radial

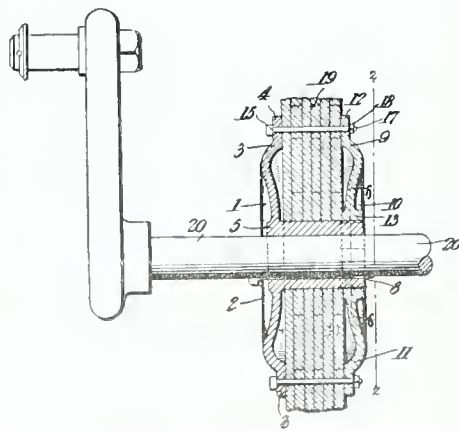


operating abutments 26 are carried by the casing and are connected exteriorly thereof by the yoke 19-20 so that they will move simultaneously. A valve seat 38 is formed on one end of the shaft, and a rotary valve 31, co-operating with the seat, is provided

with opposite steam passages that communicate with the passages of the shaft. This valve is located within a suitable casing 28 having supply and exhaust pipes 29 and 30 connected therewith. The shaft is held in any suitable manner against rotation, and it will be evident that if steam or other motive fluid is admitted through one of the steam passages, the casing will be rotated and the exhaust will take place through the opposite passage, the abutments properly cooperating with the eccentric piston 2.

Wheel Flange for Oil Well Rigs.

Mr. Samuel F. Field, of Findlay, Ohio, has assigned to the Findlay Foundry & Machine Co., of the same place, a patent recently secured by him on a rig flange. These rig flanges ordinarily consist of iron flanges constituting means whereby belt wheels may be mounted on the shafts of machinery of various kinds, but especially oil drilling rigs. The object of the present invention is to provide a rig flange for securing band wheels (that are usually made of wood) in position upon their shafts in such a manner that the wheels can be conveniently adjusted or removed,



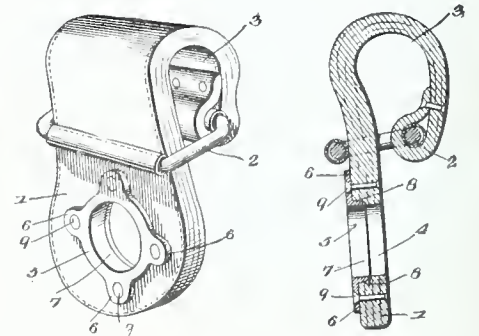
and when adjusted will run perfectly true. A pair of disks 1 are employed between which the wheel 19 is clamped. These disks have dished outer sides and inturned edges, together with annular flanges having apertures registering with each other. One of the disks is provided with a hub portion 5 having a squared end, and the other disk is provided with a central aperture exactly fitting the squared end

of the hub. Connecting bolts 15 secure the flanges to the wheel by passing directly through the same and through the apertures.

The operation and advantages of this invention will be readily understood from the foregoing description, taken in connection with the illustration. In machinery, such as well-drilling machinery and oil rigs, it frequently becomes necessary to knock down the machinery for transportation from one place to another, and it is always desirable that the pulleys, band-wheels, and the like be removed from their shafts not only in order to enable the parts to be more conveniently and economically packed, but also in order to avoid strainage upon the shafts. By this invention the wheel-holding flanges are secured upon the shaft by means of a single key, rendering the removal of band-wheels or pulleys easily accomplished. Again, the clamping flanges may be readily detached from the band-wheels by simply removing the nuts from the clamping bolts.

Neck Yoke Center.

In order to re-enforce a neck yoke center so that the pole will not tear or otherwise injure the same, Mr. Julius C. Harpham, of Lincoln, Nebr., has devised a simple and cheap device readily applicable to any neck yoke center, and has secured a patent thereon. The re-enforcement consists of a metal bushing 5 having an outer beveled face 8 and provided with an annular flange and outstanding ears



6. The bushing is inserted into the pole-receiving opening 4 of the usual neck yoke center 1, and is held in place by rivets 9 passed through the ears 6 and the several plies of the neck yoke center. For light vehicles, one protector is sufficient; but for farm wagons and heavy work both sides of the neck yoke center may be re-enforced by opposite bushings.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

BREDIN et al. v. SOLMSON.

(Circuit Court, D. Maryland. October 27, 1905. 145 F. R. p. 944.)

PATENTS—SUIT FOR INFRINGEMENT—RECOVERY OF PROFITS.

The owner of a patent, who has granted an exclusive license thereunder for certain territory, cannot, suing alone, recover profits made by an infringer which, but for the infringement, would have inured to the sole benefit of the licensee.

ALLEN et al. v. CONSOLIDATED FRUIT JAR CO.

(Circuit Court, D. New Jersey. June 5, 1906. 145 F. R. p. 948.)

1. PATENTS—SUIT TO RECOVER ROYALTIES EQUITY JURISDICTION.

A court of equity is without jurisdiction of a suit for an accounting for profits, damages, or royalties based on a contract granting a license under a patent, nor is such jurisdiction conferred by the fact that the bill also prays for the cancellation of other patents, since a suit for that purpose cannot be maintained by a private individual.

2. COSTS—DISMISSAL FOR WANT OF JURISDICTION

Where both parties have taken proofs without objection, in a suit which is subsequently dismissed for want of jurisdiction appearing on the face of the bill, defendant will not be allowed costs.

GLUCOSE SUGAR REFINING CO. v. DOUGLASS & CO.

(Circuit Court, N. D. Iowa, Cedar Rapids Division. July 6, 1906. 145 F. R. p. 949.)

PATENTS—SUIT FOR INFRINGEMENT—PLEA.

In a suit in equity for infringement of a patent, a plea which sets up the single defense of noninfringement is not a good plea, such defense being one which should be taken by answer, and the plea will either be stricken out or ordered to stand as an answer, as in the judgment of the court will best subserve the ends of justice.

NATIONAL AUTOMATIC WEIGHING MACH. CO. et al. v. NEW YORK SCALE CO.

(Circuit Court, S. D. New York. May 16, 1906. 145 F. R. p. 951.)

PATENTS—INFRINGEMENT—AUTOMATIC SCALE

The Smith patent, No. 375,102, for an automatic scale (claim 1), which covers a device for retuning the indicator to its normal position after it has indicated a person's weight by means independent of the weighing mechanism, is limited to the particular means shown. As so limited, held not infringed.

RUMFORD CHEMICAL WORKS v. EGG BAKING POWDER CO.

(Circuit Court, S. D. New York. June 13, 1906. 145 F. R. p. 953.)

PATENTS—SUIT FOR INFRINGEMENT—DISTRICT OF SUIT.

In a suit for infringement of a patent brought in the Southern District of New York against a corporation of another state having a regular place of business in New York City, infringement within the district of suit required to sustain the suit, under Act March 3, 1897, c. 395, 29 Stat. 695 [U. S. Comp. St. 1901, p. 589] is not made out by proof that an infringing article sold in another state bore a label with the name of defendant and the words "New York" thereon, in the absence of evidence that defendant made, used, or sold the article, or attached the label, or was engaged in the manufacture of similar articles in New York.

DAIMLER MFG. CO. et al. v. CONKLIN.

(Circuit Court, S. D. New York. June 15, 1906. 145 F. R. p. 955.)

1. EQUITY—PLEADING—BILL—MULTIFARIOUSNESS—PATENTS—SUIT FOR INFRINGEMENT.

Allegations in a bill for infringement of a number of patents that the inventions, each and all of them, are applied to a machine, and that defendant is using a machine "in which is embodied each and all of the inventions, improvements, or discoveries of said

letters patent," and is infringing all of said patents, are equivalent to an allegation that the inventions are conjointly used and infringed, and the bill is not objectionable on the ground of multifariousness, and especially where proof is made of the patents, which show that each of the inventions is a part of a machine, and incapable of independent use.

2. PATENTS—SUIT FOR INFRINGEMENT—PARTIES—JOINDER OF COMPLAINANTS.

Where a bill for infringement of patents alleges that a licensee has an interest in the patented inventions which is capable of being impaired by the asserted infringement of defendant, he may properly be joined as a complainant.

KRANS v. ADOLPH HOLLANDER CO.

(Circuit Court, S. D. New York. May 16, 1906. 145 F. R. p. 956.)

PATENTS—INVENTION—NECKWEAR SUPPORTER.

The Krans patent, No. 719,814, for a neckwear supporter and fastener, is void for lack of patentable invention in view of the prior art.

HALL'S SAFE CO. et al. v. HERRING-HALL-MARVIN SAFE CO.

(Circuit Court of Appeals, Sixth Circuit. June 20, 1906. 146 F. R. p. 37.)

1. CORPORATIONS—CONTRACTS—BINDING EFFECT ON STOCKHOLDERS.

A contract made by a private corporation on a sale of its property, business, and good will, that it will not again engage in business in competition with the purchaser, is not binding individually on a stockholder, even though he may have been an officer acting for the corporation in the transaction.

2. TRADE-MARKS AND TRADE-NAMES—RIGHT TO USE NAME IN TITLE OF CORPORATION—UNFAIR COMPETITION.

Hall's Safe & Lock Company, a corporation, and its predecessors in business, were engaged for many years in the manufacture of safes, which were marked and known generally as "Hall's Safes," and acquired a good reputation. The company sold its property, business, and good will, which were subsequently acquired by complainant, and went out of business. The individual defendants whose name was Hall, and who had throughout their business lives been engaged in the making of safes, subsequently organized a corporation for that purpose under the name of "Hall's Safe Company." Held, that the adoption and use of such name was within their rights, provided it was so used as not to mislead the public into the belief that the company's products were those of the Hall's Safe & Lock Company or its successors in business, against which complainant was entitled to an injunction.

3. SAME—INFRINGEMENT BY CORPORATION LIABILITY OF STOCKHOLDERS.

Stockholders in a corporation are not individually liable or subject to injunction because of unfair competition practiced alone by the corporation.

GENERAL ELECTRIC CO. v. GARRETT COAL CO.

(Circuit Court of Appeals, Third Circuit. June 11, 1906. 146 F. R. p. 66.)

PATENTS—INFRINGEMENT—ELECTRIC CONTROLLERS.

The Knight & Potter patents, Nos. 587,441 and 587,442, the first for an apparatus and the second for a method for regulating the power and speed of mechanism driven by two electric motors, such as trolley cars, were not anticipated, and cover broadly the changing of the connection between the two motors from series to multiple and the reverse, the former by shunting one while protecting the other by a resistance, breaking the circuit connection of the shunted motor, and finally reconnecting the two in multiple with the resistance cut out; and in such process of change the time of cutting out the resistance, or whether all at once or gradually, are nonessential to the invention. As so construed, held infringed.

DANIELS v. RESTEIN et al.

(Circuit Court of Appeals, Third Circuit. May 2, 1906. 146 F. R. p. 74.)

PATENTS—ANTICIPATION—PACKING.

The Miller patent, No. 524,187, for a packing for steam pistons, consisting of two wedge-shaped sections, which slide upon each other, and widen the strip when pressed upon to form a tight joint, while for a meritorious device, is void for anticipation; the form of construction having been in use

in a prior unpatented packing, and the material not being claimed as a feature of the invention.

WINANS v. PERRING et al.

(Circuit Court of Appeals, Sixth Circuit. July 30, 1906. 146 F. R. p. 133.)

PATENTS—INFRINGEMENT—PORTABLE BOATS.

The King patents, No. 389,817, claim 1, and No. 507,439, claim 2, each for a combination of elements in the construction of a portable boat, held not infringed by a construction which did not contain all of the elements of the combination of either claim.

UNITED STATES FASTENER CO. v. DUTCHER.

(Circuit Court, N. D. New York. July 9, 1906. 146 F. R. p. 136.)

PATENTS—ANTICIPATION—SEPARABLE BUTTONS.

The Pringle patent, No. 573,532, for a separable button, claims 3, and 4, which cover a button-head having a stud-catch therein, are void for anticipation by prior patents for glove fasteners.

FRANK et al. v. BERNARD.

(Circuit Court, S. D. New York. June 2, 1906. 146 F. R. p. 137.)

PATENTS—VIOLATION OF INJUNCTION AGAINST INFRINGEMENT.

A fine imposed for contempt of court in violating an injunction against infringement of a patent.

WELLS & RICHARDSON CO. v. ABRAHAM et al.

(Circuit Court, E. D. New York. April 20, 1906. 146 F. R. p. 190.)

1. INJUNCTION—CONTRACTS—INDUCING BREACH.

Complainant manufactured a proprietary medicine, which it sold under a trade-mark and only to wholesale dealers under contracts which bound them to sell, only at a certain price, and only to retail dealers who also had contracts with complainant fixing the price at which the medicine should be sold to consumers. Held that such contracts were legal, and that complainant was entitled to an injunction restraining defendants, who, not having entered into any contract with complainant, were therefore not entitled to buy and sell the medicine, from inducing any purchaser who had made such a contract to violate the same by selling to defendants, or from knowingly purchasing from any such person in violation of his contract, and also from selling the medicine to consumers after the cartons and labels containing the directions for its use had been removed from the bottles.

2. SAME—EVIDENCE OF INTENTION.

The fact that defendants, who were shown to be selling large quantities of the medicine to consumers at less than the prices fixed by complainant, before doing so removed from the bottles all cartons and labels containing numbers which would enable complainant to trace the original purchaser, in the absence of evidence showing to the contrary, was sufficient to authorize a finding that defendants knowingly participated in the breaches of the contracts between the sellers and complainant.

HILLSIDE CHEMICAL CO. v. MUNSON & CO.

(Circuit Court, D. Connecticut. July 5, 1906. 146 F. R. p. 198.)

TRADE-MARKS—SUIT FOR CONTRIBUTORY INFRINGEMENT—WAIVER OF CLAIM AGAINST PRINCIPAL INFRINGER.

Complainant brought a suit for infringement of a trade-mark, which was settled by stipulation, and a decree entered establishing complainant's exclusive right to the trade-mark from that date; but it was stipulated that neither the defendant therein nor its customers should be held liable for past infringements. Held that, having thus waived all claim against the principal infringer, a court of equity would not thereafter entertain a suit by complainant for contributory infringement against one who had made and furnished to such infringer the cartons used by it containing the infringing trade-mark.

NEW YORK HERALD CO. v. STAR CO.

(Circuit Court, S. D. New York. March 26, 1906. 146 F. R. p. 204.)

TRADE-MARKS AND TRADE NAMES—TITLE OF PUBLICATION.

Complainant held entitled to protection in the trade-mark "Buster Brown" as the title

of a comic section of a newspaper, it being shown that it was the first to use the title, and that it was so used exclusively by the complainant and its licensees for such length of time as to give it a proprietary right therein.

OUTCALT et al. v. NEW YORK HERALD

(Circuit Court, S. D. New York. March 20, 1906. 146 F. R. p. 205.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—IMITATION OF PICTURES.

An artist has no such common-law right in pictures drawn by him and sold to another, who published and copyrighted the same, as to render it unfair competition in trade for the latter to afterward publish other pictures depicting different scenes merely because they contain characters in imitation of those in the earlier ones.

WALKER PATENT PIVOTED BIN CO. v. MILLER et al.

(Circuit Court, E. D. Pennsylvania. June 22, 1906. 146 F. R. p. 249.)

1. PATENTS—SUIT FOR INFRINGEMENT—REFERENCE FOR ACCOUNTING.

Where in a suit for infringement the validity of a patent has been sustained, the general principles and scope of the invention determined, and certain structures made by defendants held to infringe, on an accounting for damages and profits the complainant is not limited to an inquiry as to the number of such particular constructions made and sold by defendants, but, except as concluded by the decree, and provided the differences be not so great and the question of infringement in such doubt that the complainant should be put to a supplemental, it not a new, bill, the whole question of infringement and its extent are generally open for consideration of the master.

2. SAME—MOTION FOR INSTRUCTIONS TO MASTER.

Where, on a reference for an accounting as to damages for infringement of a patent, the master by his rulings limits the scope of the inquiry, the matter may properly be presented to the court for decision by motion for instructions by the master.

NATHAN MFG. CO. v. DELEWARE, L. & W. R. CO. et al.

(Circuit Court, N. D. New York. July 12, 1906. 146 F. R. p. 252.)

PATENTS—INFRINGEMENT—LUBRICATOR FOR LOCOMOTIVE ENGINES.

The Woods patent, No. 645,026, for a lubricator for the valves and cylinders of locomotive engines, was not anticipated, and discloses invention; nor is it limited in scope to the precise form of valve used in the by-passage, or the precise position of the valve controlled by passage and the choked passage with relation to the duct or pipe between the lubricator and the steam chest, shown in the drawing of the preferred construction. As so construed, held infringed.

HARTFORD PRINTING CO. v. HARTFORD DIRECTORY & PUBLISHING COMPANY.

(Circuit Court, D. Connecticut. July 3, 1906. 146 F. R. p. 332.)

1. COPYRIGHT—INFRINGEMENT—USE OF DIRECTORY.

The compiler and publisher of a directory, while he may not copy and reprint matter from a prior copyrighted directory as his own, may use the same for checking up his own canvass, independently made; and where discrepancies are found, after an honest and personal investigation of the same may publish the result as so verified as his own.

2. SAME—EVIDENCE OF INFRINGEMENT—COPYING OF ERRORS.

Where, on a comparison of a copyrighted directory and an alleged infringing publication, it appears that a large proportion of the errors in the former are also found in the latter, such evidence is sufficient to refute the testimony of defendant's witnesses that the accuracy of all items in its directory was personally verified, and to show that direct copying had been done.

3. SAME—SUIT FOR INFRINGEMENT—DAMAGES.

Where the infringing parts of a directory are intermingled with other parts about which there is no evidence, and defendant makes no effort to separate them, it must account for all profits made on the entire sales, which is the only effective relief that can be granted when complainant's directory has been superseded by a later publication.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

James L. Kerstetter, deceased, inventor: The Thermal Foot Bath Co., assignees, Bradford, Pa. Foot Bath.—The object of the present invention is to improve the construction of foot bath apparatus, designed for treating feet for various ailments, such as rheumatism, gout, etc., and adapted to afford dry, wet and vapor baths, and capable of enabling medicated vapor to be applied to the feet of a person while the pores are open and not filled with water. The device enables the heat to be readily controlled, and to be entirely removed temporarily or permanently without necessitating the removal of the feet of the bather from the apparatus. The apparatus comprises a movable receptacle, and an independently movable heating device actuated by the movement of the receptacle.

George F. Mansfield, Scranton, Miss. Stocking Supporting Means.—This invention relates more particularly to means for supporting socks or stockings from short or knee drawers. It is a well known fact that it is the usual custom to employ garters that encircle the legs, but these are uncomfortable, and tend to stop the circulation of the blood. The object of the present invention therefore is to provide simple means of a novel nature whereby the socks or stockings are supported directly from the drawers, said means being readily adjustable so that the supporters may be properly fitted to the wearer. The drawers legs have tabs provided with button-holes, and the supporters consist of straps with loops formed at their upper ends, one wall of each loop having an opening therethrough. A button is located within the loop and has a shank extending through the opening in the wall. This shank detachably engages in the button-hole of the tab. An adjustable buckle connects the lower terminal of the strap to an intermediate portion of the same, forming a lower adjustable loop, and a stocking engaging device has a portion engaged in the latter loop and adjustable therewith.

William H. Fritts, Plano, Ill. Bed.—The invention relates to metallic bedsteads having open foot boards where considerable difficulty is experienced in maintaining the bed clothing in proper position, and it provides means whereby this objection is entirely overcome without interfering with the usual ornamentation of such bedsteads. The bed embodies corner posts, and upper and lower connecting frames spaced apart and provided at such intervening space with tubular bars having longitudinal slots, and a plate forming a closed panel arranged in the said space contiguous to the bed clothing to cooperate with the latter for holding the cover in place. The upper and lower edges of the plate extend through the slots of the tubular bar and are provided with projecting flanges, located within the said bars.

Wesley Slayden, Wichita, Kansas. Draft Rigging for Railway Cars.—It is the aim of the present invention to prevent draw bars and other parts of draft rigging of railway cars from pulling out and falling to the track and wrecking the cars. The draft rigging embodies a combined guide and support comprising a top wall or portion, terminal side walls extending inward from the ends of the combined guide and support, cross pieces connecting the side walls and having guide openings, and a central guide,

an intermediate draw bar arranged in the central guide, outer draw bar members mounted in the openings of the cross pieces and frictionally connected with the intermediate draw bar member, draw heads connected with the outer draw bar members, and coiled springs mounted on the outer members and arranged at the opposite faces of the cross pieces. The coiled springs mutually contribute to the cushioning of the car, so that no one of the springs will be subjected to excessive strain.

Clifton A. Crawford, Zion City, Ill. Stamp Affixer.—The stamp affixer of this patent is adapted to be used on a desk, table, or other support without clamping or otherwise securing it to the same, and it is capable of enabling stamps or gum labels to be conveniently and rapidly affixed to letters, packages, etc. It is adjustable for operating on letters or packages of various sizes, and it is adapted to moisten a portion of the surface of the same previous to affixing the stamp or label thereto. It embodies a base provided with a cabinet, a casing spaced from the cabinet, a standard located in the space between the casing and the cabinet and having an arm projecting over the former, a plunger operating within the casing, an adjustable abutment supported by the arm and located above the plunger, operating mechanism for the latter, a table spaced from the casing, and a moistening device extending into the space between the table and the casing.

Thomas E. Curd, Morley, Mo., inventor; Benjamin F. Earles, Morley, Mo., assignee. Nut Lock.—This invention has for its object to provide for use on railroads, machinery, and other constructions subject to vibration, a locking device adapted to enable a nut to be readily locked on a bolt, and having a double lock for the same, so that there will be no liability of the nut accidentally unscrewing. The nut lock comprises a bolt, having a longitudinal groove, a nut having a transverse opening, and a key consisting of a body portion extending through the opening of the nut and having its inner end arranged in the groove of the bolt, and a substantially U shaped loop having inner and outer sides, and a connecting outer portion, the outer side of the loop being connected with the outer end of the said body portion, and the inside of the loop being arranged in the groove of the bolt and fitting against the said body portion of the key, whereby the loop is adapted to engage the bolt and also retain the key in engagement with the same.

Charles Baer, Mendon, Mich. Two patents. Attachment for Animal Trap and Bean Harvester.—The first invention relates to attachments for animal traps, and its object is to provide a simple and efficient one, which, when an animal is caught in a trap by its leg, will prevent the animal from gnawing off its leg and escaping. It is also adapted to be applied to all kinds of animal traps, and is capable of being sprung by an animal pulling upon the trap in attempting to escape therefrom. The device comprises a support, a trap, an upwardly swinging spring-actuated arm carrying the trap at one end, and means for connecting the other end of the arm with the support. The arm is detachably engaged between its ends with the support, and adapted to be disengaged therefrom for swinging the trap upward.

The second invention covers a bean harvester arranged to cut or dig up two rows of beans at a time, to guide or direct the dug up plants towards the longitudinal center of the machine, to elevate said plants upwardly and over the rear end portion of the machine, and finally to dump or discharge the vines in bundles upon the ground in rear of the machine. The machine is composed of a frame,

cutting mechanism, an upwardly and rearwardly inclined fingered conveyor for carrying the material from the cutting mechanism, a cross bar, and guard members located above the conveyor at opposite sides of the fingers to lift the vines therefrom, the lower ends of the guard members being bowed around and extending in rear of the lower end of the conveyor and connected to the cross bar.

Adam Mieden, Bullfrog, Nevada. Two patents. Dumping Cars.—The first patent discloses a dumping car having a tilting body, and provided with simple and efficient means for automatically unlocking the door of the car body when the same is tilted, and also for locking the same when the tilting body is returned to its normal position. The car is also provided with locking means, which will have its unlocking operation facilitated by any pressure on the inner face of the door, whereby the unlocking operation will be rendered easy, and the door prevented from sticking. The car comprises a dumping body having a door, a plate or member mounted on the door, and a shaft provided with a substantially V shaped arm having its inner portion disposed at an obtuse angle to the shaft, and its outer portion arranged at an inclination and presenting an inclined face to the door when in engagement with the same.

It is the aim of the second patent to lower the tilting body of the dumping car, and to arrange the body close to the truck, and to improve the construction of the catch for locking the car door. The car of the second patent comprises a truck frame having a turn-table provided with a horizontal supporting plate, a transverse bar mounted on the plate at the front of the same and having upwardly extending arms, a tilting body pivoted to the said arms, rearwardly extending arms projecting from the back of the plate, locking mechanism mounted on the body for locking the door thereof, and means carried by the rearwardly extending arms for operating the locking mechanism to release the door. The locking device consists of a substantially triangular flange projecting horizontally from the lower edge of the door, and a shaft having a short arm arranged at an inclination with relation to the free edge of the door when the latter is closed. The inward pressure on the door operates to rotate the shaft when the body of the car is tilted.

Gipp N. Brewer, Sylva, Kansas, inventor; Johnson A. Black, Sylva, Kansas, assignee. Weighing and Computing Scale.—This invention is adapted to indicate accurately both the price and the weight, and to enable the tare to be counterbalanced. The scale is designed especially for use on counters, and is capable of being readily connected with an ordinary scale platform, and of being substituted for the ordinary scale beam. The scale comprises a beam having opposite curved edges, flexible connections attached to the beam, means connected with one of the flexible connections for receiving the goods to be weighed, indicating mechanism connected with, and operated by, the other flexible connection, a tare beam also connected with the latter, and a weight receiving hanger connected with the same.

Ginn M. Brewer and Johnson A. Black, Sylva, Kansas. Clothes Drier.—It is the aim of this invention to provide a clothes drier, adapted to be quickly arranged for use, and capable of folding compactly when not in use, and having means for positively locking it in operative position. The clothes drier embodies a bracket having a horizontal pintle, foldable arms supported at an intermediate point on the pintle and having their inner ends engaged with the bracket, and links

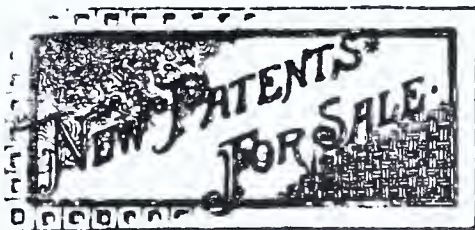
hinged to the pintle and to the arms and inclined upwardly and rearwardly when the arms are in a horizontal position, whereby the arms are locked against direct outward movement to prevent them from accidentally folding.

Henry R. Schweinler, Brooklyn, N. Y., inventor; W. T. Macon, Pensacola, Fla., and F. M. Simonton, Tampa, Fla., assignees. Speed Controller for Sewing Machines, etc. This invention is an improvement on the preceding patent and has for its object to provide a speed controller, having a continuously operating adjustable motor and a shiftable wheel, both the motor and the wheel being adapted to vary the speed, and the shiftable wheel being also adapted, when released by the operator, to automatically stop the sewing machine, or other machine driven by the motor. The speed controller comprises a horizontal frame having upwardly extending arms to be secured to the frame of a sewing machine and provided with depending lugs, guide rods supported by the lugs and spaced from the frame, a horizontal gear, a slidable motor hung on the guide rods, a driving wheel carried by the motor and movable toward and from the center of the horizontal gear, and a shiftable wheel also movable toward and from the center of the horizontal gear and connected with the sewing machine for communicating motion thereto. The horizontal gear is provided near the center with a groove or recess, and means are provided for automatically moving the shiftable wheel to the groove or recess for stopping the machine.

Jacob H. Macon, Jr., deceased, Tampa, Florida, inventor; F. M. Simonton, Tampa, Florida, assignee. Speed Controller for Sewing Machines.—The controller of this invention is a simple and efficient device designed for use on sewing machines and the like, and adapted to be employed in connection with electric and other motors, and capable of enabling the speed of such machines to be controlled and varied, as desired. The invention embodies a driving shaft, a driven shaft, a cone wheel, wheels connected with the driving shaft and with the driven shaft, a fixed shaft receiving the cone wheel, a stem or shaft fixed to the cone wheel and extending therefrom, and a hanger supporting the driven shaft and the stem or shaft of the cone wheel.

Samuel P. McCaslin, Haigler, Neb. Frameless Woven Wire Gate.—The woven wire gate of this patent, which may be made of any length, is adapted to be quickly opened and closed. It comprises a latch post having a lower loop, a gate operating lever composed of two spaced sides receiving the front portion of the gate and pivoted at an intermediate point to the same and carrying reversely arranged angularly bent portions, the lower angularly bent portion being arranged to engage the loop of the latch post and forming a stop for the same, and latch mechanism mounted on the upper portion of the lever for securing the same to the latch post.

Joseph Ducret, Reading, Kans. Hay Fork.—This invention relates more particularly to the means for detachably connecting the tines with the handle, and it is designed to permit different kinds of forks to be applied to the same handle. The device embodies a ferrule secured to the handle and having an exteriorly threaded socket, a shank connected with the tines and also provided with exterior screw threads and having a wedge for engaging the socket of the ferrule, and an interiorly threaded coupling sleeve engaging the threads of the ferrule and the shank, and connecting the same. The coupling sleeve is provided on its interior with a groove forming a smooth unthreaded portion, which separates the opposite threads.



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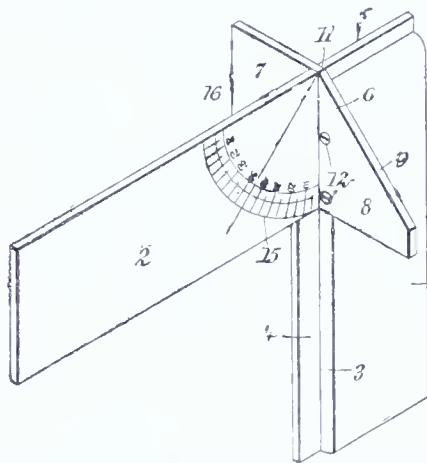
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WASHINGTON, D. C. JULY, 1907.

The Process of Smelting.

The story of smelting in America, says a writer in a recent number of *Munsey's*, reads like a fairy tale. Gold, silver, copper and lead are the metals handled by the smelters, and the outflow from the furnaces reaches a million dollars a day. The industry has become so exact that not an ounce of gold is lost in a hundred tons of soil. In fact, such scientific exactness is perhaps not found in any other industry. In each refinery there is a scale so delicate that it will weigh the scratch of a pencil. Take two morsels of paper, for instance, identical in size and weight, and write a few letters on one of them; at once this burden will tip the beam, and show an increase in weight.

On the coast of New Jersey stands a combined smelter and refinery that produces more copper than all Germany. Each day two hundred tons of copper, 8,000 pounds of silver, and a thousand ounces of gold are numbered as part of its output. The copper ore, arriving from Chile and Cuba, is first roasted to drive out the sulfur; then it is dropped into a blast furnace and molded into bars. These are refined, emerging in the form of thick plates, with a handle on each side. A plate is twice as heavy as a man; but an electric crane picks up 26 plates at once, and carries them to the tank room. Here the gold and silver are extracted by electrolysis. Each plate is hung in a tank of acid, side by side with a sheet of pure copper. Under the persuasion of an electric current, the plate decomposes, the copper being deposited on the sheet and the gold and silver being accumulated at the bottom of the tank. The process requires four weeks.

The copper is now absolutely pure, and has only to be molded into bars of various sizes. The gold and silver are removed to another building, where they are separated by electrochemical processes. The silver is cast into small eight pound ingots and shipped twice a week to England. The gold—a daily treasure of a

thousand ounces, worth more than \$20,000—is made into a single bar and expressed every afternoon to the U. S. Assay Office in New York City. Figures collected from a number of refineries show that to produce a thousand ounces of pure metal requires the treatment of 40 tons of ore for silver, 1,000 tons for copper, and two thousand tons for gold. In other words, to get one tiny ounce of gold compels the handling of 4,000 pounds of soil and rock. Such is the difficult task of the smelters. Many of these are now making ten thousand dollars a month by extracting gold and silver from the refuse-dumps of former days. The American Smelting Company has already made more gold and silver in Mexico than Cortez ever saw; and more in South America than all the rich loot of Pizarro. In Colorado, Alaska, Nevada, Ontario, Bolivia, Cuba, Africa, these organizers are transforming the gold, silver and copper business of the world from a gamble into a science.

A New Railway Car.

Steam has many rivals these days. Electricity, from being hailed as the coming power, may be said to have arrived: but gasoline, alcohol, compressed air, gases in various forms, present possibilities that have not yet been fully realized. Consequently, the daily press teems with accounts of new locomotives, new motors in which these agents, or combinations of them, are being tested. Many of these trials, it may be added, have been most successful. The latest, according to one of the editors of *Motor Age*, is a railroad car which is of the gasoline—electric build, with a gasoline engine which furnishes the power to drive an electric generator carried on the car. This generator, in turn, supplies the electric current for driving electric motors carried on the car trucks. This car, it is asserted, has all the flexibility of speed that the electric trolley possesses, and has the additional advantage that it does not require overhead electric wires for conducting the electric current, or a third rail along the surface, but can operate on the lines of any steam railroad, being in itself a complete unit, carrying the fuel to operate the gasoline engine and furnishing itself the electricity that runs it.

In appearance, we are told, the car resembles the large interurban electric cars now in use, except that the trucks are heavier, the steel framework being commensurate with the greater strains consequent upon traveling at speeds as high as 60 miles an hour, and the body framework is stoutly braced, as in the steam railroad coaches on standard railroad lines. One man can run the car, his duties corresponding to those of an engineer, the fireman being eliminated. The operator need only see that the speed is regulated through the electric motors. The engine can run mile after mile on less than half a gallon of gasoline, making an approximate cost of four and a half cents a mile. The car carries a tank that will carry it 225 miles without stopping; in other

words, it could cover the distance from New York to Chicago with but three stops for fuel, and the expense of gasoline for the trip would be but a little more than the cost of one first class fare on an 18-hour train. Since the car can make 50 or 60 miles an hour, the economy of operation is apparent.

Among the advantages of this type of car over the ordinary trolley are enumerated the fact that electric power houses along the line are done away with, as well as big machinery plants for generating the current. The costly overhead wires along the tracks are not needed, nor is the dangerous third rail. This further eliminates the necessity of an electric repair force whose duty it is to attend to overhead wires—a great advantage when we remember the havoc that snow, sleet and heavy winds are apt to work with the wires or the third rail. Compared with steam cars, it is noted that the ordinary engine goes but a hundred miles at the outside before stopping for fresh supplies of coal and water; while the new car carries fuel for over 200 miles and enough water for a day's continuous running. The smoke nuisance is also done away with: and—by no means an unimportant item—when the current is not being used by the electric motors in propelling the car, it is employed to recharge the battery, which gives the car a great range of possibilities for use on mountain roads and in carrying varying loads.

Whether the revolution in railroad passenger traffic which has so often been promised us, is brought about through this car, we are glad to welcome any newcomer in the field of transportation that is heralded by such an authority. If the man who, in the leisurely days of our forefathers, coined that phrase "haste makes waste" could see the hurrying of the modern generation, he would realize that nothing is now considered a worse waste than the lack of haste. Time was never at a greater premium than today.

Glass Bridge Half a Mile High.

The highest bridge in the world has been constructed over the deepest chasm in the Rocky Mountains—and one of the deepest to be found on the surface of the globe. This remarkable structure is regarded as the pinnacle of the sensational features of entertainment that are constantly being introduced to attract tourists to the peaks of the Continental Divide. The bridge crosses the famous Royal Gorge of the Arkansas River, and the Royal Gorge is the narrowest point in the Grand Canon of the same stream. At the point where the bridge leaps from one side of the abyss to the other, the walls are but 50 feet apart at the bottom and 250 feet at the top. The sides rise almost perpendicularly, and are of granite, decomposed and iron stained until the colorings blend into innumerable pleasing effects. The rent discloses the oldest geological formation known to writers of textbooks on the subject, and has always drawn interested travelers. It already has a bridge, at the bottom,

that is considered a monument to engineering skill. The gorge was not wide enough to admit a railway alongside the river, and a so-called hanging bridge was built some thirty years ago. Huge steel trusses, anchored in the rocks on each side the river, carry the central weight of the bridge, the subsidiary supports being large steel rods depending from the trusses to the ordinary bridge construction, which is 70 feet long, extending parallel to the course of the stream. When trains pass through this gorge, they stop on the bridge to permit passengers to examine the interesting sights of the vicinity. The new glass bridge will afford a much better opportunity of seeing the canon, besides giving the novel sensation of being suspended half a mile up in the air. The bridge, to be exact, will be 2,550 feet above the railway track, 22 feet wide, and 230 feet long. It will be constructed of flat steel and steel cable, such as is utilized in suspension bridges. The floor will be of plate glass, an inch and a half thick. The railings at the side will be so high that one can look over without danger of falling, even those who experience dizziness at such altitudes.

It is the intention of the promoters of this enterprise to construct an electric road from Canon City, six miles east of the hanging bridge, up to the summit of the range through which the gorge is cut. A hotel will be constructed at the summit, as well as other accessories of a summer resort, including trails into the canon via its steep sides, over which mountain climbers may journey afoot or on the back of the patient burro. A few years ago, such a project as the building of this electric railway, not to speak of the glass bridge, would have been held the dream of a lunatic; but such has been the advance in engineering that no mountain is considered too lofty to climb, no chasm too difficult to traverse.

Asbestos and Its Uses.

Cotton stone, mineral wool, vegetable mineral, mineral cotton, are names variously applied to the substance generally known by the Greek word asbestos, or inconsumable. Asbestos plays an important part in the domestic and mechanical arts of our every-day life. It is familiar to most people, yet many use it without knowing it, while the list of its commercial applications is surprisingly long. In the kitchen it appears as stove mats, stove polishers, flat iron holders, lamp wicks and fire pads under the gas burner. Often the range is lined with it. The house itself may be fire-proofed with asbestos wall plaster, asbestos roofing material and asbestos paint. In factories the steam pipes are overlaid with it; machinists use yarn made from it for packing piston rods and valve stems, and electricians find it valuable as a non-conductor. In the theatre it appears as an auxiliary stage curtain, and firemen wear uniforms made of it. Storage rooms on ocean vessels are lined with asbestos and chemists value the fiber as a filter. Fire will not burn asbestos,

and the most mordant of acids leave it unharmed.

In its natural state, it appears as a sort of fibrous stone, and the process of manufacture consists in separating the fibers from the waste rock in which they are found, and weaving them into merchantable form. These fibers appear in different varieties, some brittle, others flexible and easily separable into fine, silky threads. The ore is mined in open quarries. The earth is removed to a depth of usually a few feet, exposing the asbestos veins, and the rock is cut into a series of terraces and then drilled and blasted like ordinary stone. The fibers are separated from the other rock by a machine which crushes the particles almost to a powder. This is then passed over a shaking screen to remove the sand, and the particles of iron are removed by electric magnets. This powdered asbestos is utilized for paint, and the very fine fiber is of great value for filters, as it is proof against the action of acids and alkalis. These filters are usually made in the form of a cloth, and when a deposit has collected on it from laboratory work, the chemist has only to throw it in the fire. The deposit is burned off, and the filter is ready for use again. In London and Paris, the water for the public service is filtered through asbestos.

Powdered asbestos is also used for making paper, which will probably become into use as it is widely placed on the market; and for millboard, employed for fire-proof deed boxes and the like. Asbestos figures in the composition of roofing material, of wall paper and plaster and of tiles. The time is at hand when we may see an asbestos building, from cellar to roof, for fireproof bricks are being made of lime, sand and asbestos, and have withstood a temperature of 2,000 degrees. As an insulator, asbestos appears in all modern office buildings, miles of pipes being so covered in recently erected sky scrapers. In this capacity it has three advantages: reducing temperature, saving fuel and increasing power. Uncovered pipes lose power and waste fuel, but when covered by a paste of asbestos fiber and magnesia within an outer coating of canvas, this loss is prevented.

One of the most important uses of asbestos cloth is for theater curtains; it is also made up into uniforms for firemen, including boots, trousers, aprons, gloves, mask and head gear. Glass moulders and iron workers likewise wear aprons of asbestos cloth. In making this cloth, the fiber is first carded and condensed, like cotton; and after the threads have been twisted, they are braided or woven into cloth, rope, etc. on looms that look not unlike those in ordinary weaving mills, but have essential differences. Asbestos is found in many countries, but Canada has practically a monopoly of the best grades—those employed for weaving and manufacturing.

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Nitric Acid from Air.

The announcement that Sir William Crookes has discovered a process by which nitric acid may be extracted from the air has aroused great interest among scientific and commercial men on both sides of the Atlantic. It is claimed that sufficient quantities of the acid can be extracted by the new process to make it available for commercial purposes.

Making the Deaf Hear.

It is reported that the telephone, among other uses, possesses the power of making the deaf hear. The discoverer of this remarkable secret says that he has two friends who are so deaf that it is necessary to shout close to their ears: but through the telephone they can hear everything, no matter how quietly spoken. If this report is verified, there is an excellent opportunity here for a scientist to invent a simple telephonic apparatus for the deaf, and amass a fortune. Several instances are known where the hearing of telephone girls has been improved through the effort to distinguish sounds over the wire.

A Pocket Telescope.

An important little device which has been credited to a British officer, consists of a lens mounted in a metallic ring, to which a clip is attached. By means of this clip, the lens can be fixed to the end of a cane or umbrella. Held thus at a convenient distance from the eye, the little glass performs the function of a small telescope, or field glass, magnifying distant objects. This tiny contrivance can be put to numberless uses, and will be found convenient in the many instances where one would like a field glass, but cannot conveniently carry one.

Throttling a Foreign Devil.

The strong aversion of John Chinaman for the railway is notorious the world over. To him it is a devil of the foreign devils. It runs with irresistible strength, no matter whether prayers are directed for or against it; it makes its way unharmed through regions supposed to be peculiarly sacred to the spirits of the mighty dead.

When Turkey admitted the telegraph it was because her wise men believed that the devil runs up and down the wires with the messages, and so, the good Turks hoped, he would be kept too busy to worry folks below. The Chinaman has no such consoling reflection in regard to the iron horse. The Boxers broke up some of the trains and set fire to others. Some even ventured on an engine. Steam was up. One of the creatures burned his hand and he clutched a valve. The engine shot forward, with a load of frightened Boxers in it. Down hill it went at a terrific pace, until it came to a place where the Boxers had thoughtfully torn up the line. Then over an embankment it leaped, to smash itself and every man aboard it. The incident was most discouraging to the Chinese in its demonstration of the power of the foreign devil. All things considered, it is not sur-

prising to learn that the big railway scheme which China has on hand has been transferred from the control of the imperial authorities to the provincial. It takes managers on the spot to cope with the obstacles thrown in the way of the railroad in China.

Wireless Telephones.

It is doubtless a natural consequence of the great amount of attention given to wireless telegraphy that the dreams of inventors should turn to telephones similarly operated. The wireless telephone is now in successful operation over a distance of 10 miles. This is merely a beginning; for while the difficulties of the ordinary telephone increase rapidly with the distance to be spanned—as all users of long distance lines know to their cost—the same truth does not apply to the wireless system. Moreover, extraneous sounds are conspicuous by their absence. Each station consists of a telephonic battery, a special form of induction coil, and a number of insulated wires combined to form a kind of frame. It may be that the wireless telephone will have the same disadvantage that besets telegraphic systems depending on the radiant form of electricity for their operation. The messages from the transmitting station will radiate in all directions and will be heard at all receiving stations within its sphere of influence. In this case, there would not only be no privacy about the conversation, but if six stations, say, were working simultaneously, the corresponding receiving stations would each receive six messages at once, and the resultant confusion of tongues would put the Tower of Babel to shame. If, however, wireless telephony comes to be accepted, it will no doubt find a sphere of usefulness of its own. For submarine use, for instance, it would have no rival. Telephoning across the sea is impossible now, because of the effect due to the electrical capacity of a cable submerged in water. Here is an open field for the wireless method. The day may be anticipated when actual personal speech may be possible across the ocean.

Electrical Novelties.

At a recent exhibition of electrical appliances in Lyons, France, there were many clever devices showing the progress of electricity as applied to industry. The various applications of electricity to heating, foot warmers, chafing dishes, bath heating apparatus, etc. were illustrated. Electrically driven agitators and bottle shaking devices for laboratories were shown, some with ingenious special devices for securing regular and graduated agitation, useful in the culture of certain germs, bacilli, etc. There was also a dessicating apparatus for laboratory use, in which the heat was automatically regulated by the current working contacts in connection with a thermometer or other device based upon expansion. Another device for the removal of scales from inside the tubes of water-tube boilers, was remarkable for the power of the motor as compared with its diameter and the general efficiency

of the invention. The motor was of a diameter small enough to go directly within the tube from which the scale is to be cleaned, and was yet of sufficient power to perform the work with great rapidity.

A portable vacuum dusting and cleaning apparatus was also exhibited, consisting of the usual pumps, filters, etc., driven by a motor which develops a quarter of a horse power, all enclosed in joiner work so as to present the appearance of a neat piece of furniture. It could be easily moved about, so that a small length of hose only was required to reach any place in a room. This apparatus is especially handy in cleaning the cases in a printing office. For this purpose a special nozzle is used, through which all the dust in the boxes is sucked away. A sieve-like metallic netting covers the mouth of the nozzle and prevents the type from being drawn into it. This device, although not new, as various types of vacuum cleaners have for years been on the market, is interesting in its emphasis of the passing of the broom. The London *Lancet* declares that the broom threatens soon to be as obsolete as the old copper warming pan. The change is one which must meet with unqualified approval by all who know what a breeding ground of disease is the common dust of our houses. There are many disease germs in this dust, and there is evidence of an eminently practical character that it is otherwise a source of sickness; and there could hardly be a more effectual means of spreading infection than the old fashioned broom. This method, the *Lancet* asserts, is not only unsanitary, but absurd from the point of view of its application. The broom may clean a carpet well enough, but the dust is only scattered and spread. On the other hand, the vacuum cleaner enables the dust and its pathogenic contents to be removed and destroyed by fire.

Evaporation Problems.

An exceptional opportunity for studying evaporation in relation to climate is afforded by the Salton Sea. As is generally known, the sea was created by the accidental turning of the Colorado River into the Salton Basin, a dry valley in Southeastern California lying below the level of the ocean; and now that the river has been restored to its original channel, the sea has begun to dry away. The time required for its complete dissipation is estimated at from 10 to 15 years, and during that period the accession of water from all sources will be nominal. It will thus constitute an evaporation pan on a grand scale, and the measurement of its progressive lowering will give valuable information to engineers charged with the planning of reservoirs. The matter is also important to meteorologists, and a joint investigation will be made by the Weather Bureau, the Geological Survey and the Reclamation Service. To determine the relation of the evaporation to temperature, atmospheric humidity and wind, meteorological stations will be maintained in the basin, and an effort will be made to develop rules for the estimation of evaporation in any locality where the ordinary climatic factors are known.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,

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Paper finishing machine..... S. C. & R. B. Warner
Pasteurizing apparatus..... F. Tyson
Pattern maker's tool..... G. G. Richmond
Pencil sharpener..... D. Stamey
Phonographic horn support..... L. P. Halladay
Photographer's light regulator..... A. C. Novess
Photographic paper..... A. & L. Lumiere
Piano notes. Means for repeating..... F. Pelissier
Pianos. Foot rest for..... W. E. Bailey et al
Picture apparatus..... A. E. Colgate
Picture effects. Device for producing moving..... E. Keen
Pictures, designs, &c. Producing..... T. A. & J. B. Connolly
Pile fabric. Woven..... W. A. Minifie
Pile wire hook..... J. H. Myers
Piles. Apparatus for inserting..... G. H. Fryer
Pin..... E. Anderson
Pin..... F. H. Noble
Pin lock..... E. L. Sprenger
Pin setter..... H. J. Anderson
Pipe cleaner..... L. W. Roe et al
Pipe fitting..... F. Kiuche
Pipe joint..... A. M. Saunders
Planter..... H. T. Monson
Plate lifter..... E. F. Welch
Pliers. Holding..... O. N. Steenstrup
Plow. Wheeled..... A. B. Freuler
Pneumatic carrier..... M. B. Rizzo
Pneumatic elevator..... K. Bruchle
Pneumatic service carrier..... M. B. Rizzo
Pool table..... H. L. Haskeil
Postal card. Self fastening..... A. B. Magoun
Postal card. Souvenir..... E. G. Adams
Potato digging machine..... E. G. Schreiber
Potato eye remover..... A. C. Keut
Powder dispensing receptacle..... E. Terry
Power transmitting device..... J. T. Kinkead
Printing device..... J. S. Duncan
Printing press..... B. W. Morgan
Propeller..... A. Flad
Pulley. Expandable..... C. J. Reed
Pump crank..... A. Margadant
Pump. Electric..... W. Lambert
Pump. Liquid measuring..... G. Yanaceponlo
Pumping engine..... C. L. Heisler
Rail. Ball bearing..... G. I. Barnes

Rail chock. Adjustable guard..... H. E. Miller
 Rail for roundhouses. Drop..... H. J. Drummond
 Rail joint..... W. M. Brown
 Rail joint..... J. O. Bridges
 Rail tie and fastening..... W. J. Kost
 Railway. Aerial..... W. J. Hogan
 Railway grading machine..... O. C. Mann
 Railway rail..... J. N. Aharman
 Railway rail..... W. G. MacLaughlin
 Railway safety device..... O. F. Kloetzer et al
 Railway signal..... F. H. Wendt
 Railway signal fuse..... F. Dutcher
 Railway switch..... S. J. Baxter et al
 Railway tie..... C. E. Will
 Railway tie..... J. G. Parkerson, Jr
 Railway tie..... E. T. Forrester
 Railway tie..... C. C. Daniels
 Railway track construction..... W. Lee
 Railways. Electric block system for..... W. R. Fuller
 Rake..... E. W. Dowd
 Ratchet wrench..... C. Miller
 Razor stropping machine..... E. G. Kaufman
 Refrigerator..... H. J. Shannen
 Refrigerator. Window..... B. Meyer
 Rein holder..... G. H. Fernald
 Resistance unit..... H. E. Heath
 Ribbon fastening machine..... A. M. Magee et al
 Rock drill..... E. Leichter
 Rock. Fracturing..... G. S. Githens
 Roller..... H. A. Veisard
 Roof for mansoleums, tombs, vaults, &c..... C. E. Tayntor
 Roof for mansoleums, vaults, &c..... C. E. Tayntor
 Rowing device..... W. D. Gift
 Rubber coating. Making a solution for hard..... E. F. Upton et al
 Sack packer..... G. M. Buskey
 Sad iron heater. Electrical..... C. V. Hill
 Saddle..... P. S. Brodie
 Safe door..... E. Pascoe
 Safety pin. Automatic..... W. Coyle
 Safety pin. Double pointed..... H. Kaspar
 Safety switch. Automatic..... W. R. Jenney
 Saw..... W. A. Miller
 Saw..... T. L. Wallace
 Saw..... W. Vartmann
 Saw. Pneumatic log..... R. Fullerton
 Saw set..... J. V. Strombom
 Scaffold bracket. Adjustable..... J. J. Dennis
 Scale..... H. F. Shaw
 Scale. Weighing..... A. Chronik
 Screens. Fly exit for window and door..... W. H. Phillips et al
 Screw thread cutting die..... F. D. Randall
 Seal bolt..... J. B. Orfison, et al
 Seal. Self locking..... W. F. Harris
 Seat attachment. Spring..... E. Anderson
 Sectional or compartment can..... E. W. Carnes
 Sewing machine presser foot attachment..... D. H. Hadsell
 Shaft and pulley collar..... E. L. Beal
 Shaft bearing..... W. H. Coldwell
 Shaft coupling..... G. B. Kinsler
 Shaft hanger support..... P. Weber
 Shaft. Vehicle..... J. Buchheit
 Sharpener. Lawn mower..... S. A. Cheney
 Shaving cup..... S. Attanasio
 Shears..... J. Cook et al
 Sheet feeding machines. Sheet separating device for..... E. Tyden
 Sheet metal rim or felly..... C. Heart
 Sheet registering device..... E. Hammer
 Shepherd's crook..... C. Harding
 Shipping case..... N. I. Busby
 Shoe shank and ventilator. Combined..... J. Ball
 Shoe. Ventilating..... M. Villacampa y Villacampa
 Sight feed..... J. C. Hill
 Signal..... C. P. Roggles
 Signal light..... A. W. Colom
 Signal system. Supervisory..... H. G. Webster
 Silo..... A. O. Hubbard
 Skate wheel. Roller..... W. W. French
 Skate adjuster..... C. O. Anderson
 Sled. Cardboard..... E. W. Birt et al
 Slicer. Vegetable..... U. A. Imes et al
 Slicing meat, sausages, and other edibles. Machine for..... A. Brinhaus
 Soap box..... K. Nishimoto
 Spinning or twisting machines. Tape pulley for..... F. W. Nims
 Spring structure..... A. Steadman
 Spring wheel..... H. Neubert
 Stacker. Hay..... E. Schmitz
 Stamp affixer..... C. A. Crawford
 Stamping devices. Mat for ticket or other..... W. A. Albough
 Starching machine. Shirt..... J. W. Brittain
 Steam boiler..... C. G. Wieland
 Steam deflector..... G. J. Henry, Jr
 Steam engine..... C. L. Schults
 Steam generator..... E. L. J. Wera
 Steering and controlling device..... R. M. A. B. Munro
 Stenciling machine. 2 pats..... B. C. Stickney
 Stencils or other articles. Frame for..... J. S. Duncan
 Stereoscope folding handle..... H. C. White et al
 Stereotype plates. Machine or casting box for making..... H. F. Beckman
 Stereotyping and type metal founding apparatus..... H. F. Beckman
 Sterilizer..... W. Castle
 Sterilizing, disinfecting, or odorizing vehicles. Automatic apparatus for..... H. S. Blackmore
 Still. Mercury or quicksilver..... R. A. Lackmann
 Stove top member..... H. A. Starr
 Stoves. Means for collecting and carrying off smoke and odors from..... C. B. Whipple
 Stoves. Tilting frame for cooking..... J. S. Van Buren
 Stovepipe elbow..... J. F. Foster
 Sump..... F. H. Rile
 Supporting bracket for odometers, &c..... H. J. Boon
 Surgical appliance..... F. D. Huebner
 Sweeping and scrubbing machine..... E. J. Stewart
 Switch..... G. Gilmore
 Switch controlling mechanism..... H. Geisenhoner
 Switch structure..... H. C. Stiff
 Switch tongue operating and retaining device..... N. Burns
 Tabulating machine..... D. E. Felt et al

Tank lining..... H. M. Reynolds
 Telegraph transmitter..... C. W. Leiser
 Telegraphy. Wireless..... W. W. Massie
 Telephone and switching mechanism. Desk..... A. K. Audriano
 Telephone calling or signaling device..... K. Weman
 Telephone exchange system..... A. R. Kahl
 Telephone exchanges. Registering system for..... A. R. Pollock
 Telephone receiver..... A. F. H. Davis
 Telephone receiver holder..... W. A. Beavan
 Telephone switchboards. Spring jack for..... F. R. McBerty et al
 Telephone system..... G. Babcock
 Telephone system. Automatic..... F. Merk
 Telephone trunking system..... H. G. Webster
 Telephone trunking system..... W. W. Dean
 Test frame. Portable..... R. P. Orr
 Thill support..... J. W. Sherwood
 Thimble. Handle..... J. Dublissie
 Threshing machine baling attachment..... R. C. Redpath
 Tie plate..... 2 pats..... W. L. De Remer
 Till..... C. Welles
 Time card. Sump..... C. S. Bissell
 Time recorder. Workman's..... C. T. Hawley
 Tire. Vehicle..... G. E. Hurdley
 Tobacco booking machine..... W. Wadsworth
 Tobacco stripping..... C. F. Hall
 Toe spreading retainer..... P. Wall
 Toilet box. Combination..... A. D. Herman
 Toilet cream..... M. S. Borden
 Tongue supporter. Wagon..... F. Abrams et al
 Tongue. Vehicle..... G. I. Haise
 Tool. Combination..... H. Brown
 Tool. Combination..... R. Madsen
 Tool. Compound..... J. N. Peterson
 Tool. Fluid pressure..... G. H. Gilman
 Tool operating mechanism..... F. K. Priest
 Tool. Pneumatic..... C. W. Meadowcroft, Sr
 Tooth powder retainer..... E. R. Godward
 Toothpick making machine. Wooden..... I. H. Nute
 Toy..... W. H. Pearson et al
 Trace loop or buckle..... J. P. Heiser
 Transformer..... J. I. Frank
 Transformer..... M. O. Troy
 Transformer. Three phase..... J. J. Frank
 Transmitter. Breast..... J. A. Birsfield
 Trigger mechanism..... F. A. De Land
 Trolley harp..... E. D. Rockwell
 Trolley lever..... M. F. Hodge
 Trolley wheel lubricator..... J. F. Cottrell
 Trousers hanger..... R. H. Tye
 Truck. Car..... R. H. Brown
 Truck. Combination elevator..... G. W. Peter
 Truck..... W. Hutton
 Turbine..... P. Phillip
 Turbine. Elastic fluid..... W. L. Water
 Turbine. Gas..... H. Holzwarth
 Turbine vane..... C. A. Backstrom
 Turret head..... H. H. Wogaman
 Type casting mold..... P. G. Nuernberger et al
 Type. Metal..... J. S. Duncan
 Type writing attachment for adding machines..... E. B. Cram
 Type writing attachment for adding machines..... A. G. Meier
 Type writing machine..... W. F. Helmond
 Type writing machine..... C. F. Lundberg
 Type writing machine..... L. R. Roberts
 Type writing machine. 2 pats..... H. L. Wagner
 Type writing machine..... E. L. Pfunder et al
 Umbrella support..... J. W. Butler
 Valve..... J. A. Tilden
 Valve..... M. C. Honeywell
 Valve..... B. A. Raxter
 Valve. Automatic expansion..... A. H. Eddy
 Valve. Expansion..... A. H. Eddy
 Valve for refrigerating apparatus. Automatic expansion..... A. H. Eddy
 Valve. Hot blast..... J. B. McKennan
 Valve lubricator. Automatic..... W. L. Newbaker
 Valve operating device. Finishing..... W. H. Ludewig
 Valve. Piston..... P. Kinander
 Valve. Pressure regulating..... F. F. Healey
 Valve. Regulating..... A. H. Eddy
 Valve. Retaining..... M. Somers
 Valve. Turbine nozzle..... C. A. Backstrom
 Vehicle..... R. E. Adams
 Vehicle brake..... A. B. Caldwell
 Vehicle wheel and pneumatic tire for same..... R. Dalmer
 Vibratory apparatus for ear treatment..... E. Meyer
 Voting machine..... A. McKenzie
 Voting machine..... G. S. Dey
 Wagon body..... W. Hunt
 Wagon. Dump..... W. A. Underhill
 Wagon. Dumping..... J. Brennan
 Wagon. Dumping..... W. G. Mayer
 Wagon. Garbage..... A. Gull
 Waist and skirt supporter..... E. J. McKinney
 Wall for buildings, masonry work and the like..... J. Peters
 Wall structure..... J. Lally
 Warp stop mechanism..... T. Perks
 Watch movement box..... J. H. Goss et al
 Water circulating apparatus..... L. M. G. Delaunay-Belleville
 Water closets, &c. Flexible connection for..... P. F. Lyons
 Water heater. Electric..... E. C. Miles
 Water heater. Storage..... E. Rind
 Waterproofing compound..... A. Gross et al
 Weed exterminator..... M. Schmitt
 Weighing apparatus..... A. O. Watts
 Welding apparatus. Step by step electric seam..... H. Helberger
 Well drills. Swivel rope socket for..... O. E. Lindholm
 Welt shaping machine..... L. Goddu
 Wheel..... I. W. Giles et al
 Wheel..... W. R. Caldwell
 Wheel rim and tire..... P. Ebner
 Wheel rim or felly..... H. Patand
 Whiffletree clip..... H. F. Gray
 Winding machine. Yarn or thread..... I. S. Ainley et al
 Window..... H. R. Schweinler
 Window catch..... C. A. Hammar et al
 Window cleaner..... M. S. Heabler
 Window holding and antirattling device..... J. B. Hunt
 Window screen and the like..... J. F. & L. F. Buck
 Wire. Barbed..... D. C. Smith
 Wire machine. Barbed..... D. C. Smith

Wire stretcher..... F. W. Reichert
 Wrench..... F. A. Bucey
 Wrench..... W. E. Ingram
 Wrench..... J. Knowles
 Wrench, threading die and pipe cutter. Combined..... B. I. Borsen
 DESIGNS.
 Badge or emblem..... R. S. Clymer
 Bowl..... F. C. Parache
 Chandelier body..... E. Gothberg
 Emblem. Baseball..... J. B. Levi
 Emblem. Fraternity..... D. S. Wilson
 Fabric. Pile..... C. Sackman
 Fabric. Textile. 6 pats..... S. L. Crownfield
 Flask..... J. M. Lewis
 Horn..... L. L. Terhune
 Medal..... F. B. Rhodes
 Mirrors, brushes and similar toilet articles. Back for..... 5 pats..... G. B. Berry
 Post card..... E. Fritzsche
 Range. Gas..... A. T. Wehrle
 Reflector or similar article..... O. A. Mygatt
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 MECHANICAL PATENTS.
 Accounting apparatus..... J. S. Caldwell
 Addressing and printing machine. Envelope..... M. P. Keena
 Air brake pistons and cylinder heads. Device for holding..... W. S. Scott
 Air compressor. Automatic tidal..... W. O. Webber
 Air compressor combined with an explosive motor..... A. Michlin
 Air. Heating and humidifying..... W. H. Carrier
 Air ship..... E. Baumann
 Air ship. Advertising or other..... C. B. Burnell
 Alcohols and their derivatives. Production of aromatic reissue..... C. Mettler
 Alloys. Manufacture of..... G. E. Bittenshaw
 Armature. Magneto..... T. Hubert
 Armature. Magneto..... C. F. Spiltdorf
 Assembling apparatus..... N. Marshall
 Assorting device..... H. Howell et al
 Automatic gage..... P. M. Freer
 Automobile..... I. W. Richey
 Automobile life guard or fender..... B. F. Hart, Jr
 Automobile running gear..... A. Groenig
 Automobile steering gear socket..... H. T. Cameron
 Awl. Sewing..... L. G. & C. P. Carillon
 Axle..... E. G. Harlie
 Axle. Jointed spindle..... M. Bidean
 Rag fastener..... H. Tuckmantel
 Bag holder..... O. Cronholm
 Bait. Artificial..... E. A. Grout
 Baking utensil. Cake and pie..... L. Nelson
 Baling press..... C. W. Field
 Baling press..... C. E. Bower
 Baling press..... J. S. Tuttle
 Barn and shed. Wooden..... M. von May et al
 Barrel or receptacle..... H. S. Reynolds
 Basin and bath tub attachment..... G. A. Steiner et al
 Battery plate and making same..... J. Bijur
 Beam. Structural..... H. F. Voshardt
 Bearing. Antifriction..... T. Fox
 Bearing. Ball..... H. B. Keiper
 Bed and couch. Combined..... D. T. Owen
 Bed. Baby folding..... N. P. Thompson
 Bedstead. Metallic..... J. & H. J. Brookes
 Belt stretcher..... S. F. Eshelman
 Beryllia from alumina and iron. Separating..... F. Bran et al
 Bicycles, &c. Gearing for..... M. Pedersen
 Bill hook..... E. D. Conklin
 Binder. Loose leaf..... J. C. Dawson
 Binder. Loose leaf..... J. C. Dawson et al
 Binder loose leaf..... T. E. Heeter
 Binder. Loose leaf..... D. S. Baird
 Binder. Temporary..... C. I. Bryant
 Bleaching, sterilizing or conditioning agent. Producing a..... S. Teetham
 Boat. Submarine..... L. V. Spear
 Boat. Submarine..... J. M. Cave
 Bobbin turning apparatus..... R. M. Goodnow
 Roller hanger..... T. C. Best
 Rollers. Hand hole plate for..... R. C. Stevens
 Rock back. Loose leaf..... W. I. Schults
 Rock holder. Reference..... N. H. Fulton
 Root and shoe..... F. R. Duncan
 Rott's closure..... J. Slonka
 Rottle or container. Cellular..... C. S. Jackson
 Bottle stopper..... A. M. Edwards, Jr
 Bottle washing and scrubbing mechanism..... W. Seidel
 Rottle washing machine..... R. G. Nash
 Rottle wire cutter..... J. A. Goebler
 Bottles and the like. Machine for washing..... R. G. Nash
 Brake shoe key..... D. H. Fairbanks
 Bridge. Portable..... F. Charrou
 Bridge..... F. A. Stimson
 Brickets from coal, peat and bog earth. Manufacture..... J. Busa
 Brooder..... G. W. Meacher
 Broom rack..... O. C. Fletcher
 Brush. Fountain..... H. Nothe
 Ruggies. Foot rest for..... J. B. McCarty
 Ruggies storm front..... M. W. Beardsley
 Ruggies ton. Lever actuated..... A. Groenig
 Building block..... F. W. Oelschlaeger
 Building block mold. Hollow..... W. J. Fankner
 Building construction. Clip for metal..... W. Gosa
 Butter and fats. Apparatus for melting and purifying..... C. A. Janson
 Butter. Manufacture of process..... R. Roos
 Button..... W. S. Osborn
 Button. Collar..... A. Gaines
 Cabinet. Kitchen..... I. O. Curtice
 Calendar..... J. E. Treat
 Calendar. Lunar..... G. Casale
 Can filling machine..... C. H. Ayars
 Can opener..... H. Rutt
 Cane cutting and conveying machine. Sugar..... H. G. Ginaca
 Cane cutting machine. Sugar..... H. G. Ginaca
 Canister. Soap powder..... H. C. Fairchild
 Car..... S. Otis
 Car chute..... C. L. Spurlin
 Car. Convertible..... T. A. Brill
 Car coupling..... E. O. Warner
 Car door. Grain..... T. Leonard
 Car door hanger..... R. G. Bullard

Car door mechanism. Dump..... D. H. Foreman
 Car draft gear. Railway..... C. T. Westlake
 Car frame. Passenger and like..... A. Christianson
 Car. Passenger and like 3 pats..... A. Christianson
 Car. Railway..... S. Otis
 Car underframe. Metallic..... J. M. Harsen
 Car underframe. Passenger and like..... A. Christianson
 Cars. Electric lighting system for railway..... W. J. Boban
 Cars. Metallic compartment construction for passenger and like..... A. Christianson
 Carbonating apparatus. Liquid..... S. Twitchell et al
 Carbureter..... J. W. Smith
 Carbureter..... H. M. Reicherbach
 Carrier..... G. W. G. & M. J. Beatty
 Cart. Log..... J. A. Perry
 Cartridge pocket..... F. R. Batchelder
 Casting and conveying machine..... W. McVay
 Cattle guard..... T. Ellis et al
 Ceiling mold..... 2 pats..... I. B. Blaw
 Chair..... R. Matthews
 Chair attachment..... A. Thompson
 Chair fan attachment..... J. F. Dorris
 Cheese cutter. Computing..... R. H. Naff
 Chimney and ventilating shaft top and the like..... A. Boltzner
 Chimney cleaner..... O. N. Miller
 Churn..... W. J. Rine
 Cigarette making machine..... L. B. Baron
 Circuit closing device..... F. W. Erickson
 Clasp..... E. K. Sumnerwell
 Clasp..... C. H. Phillips
 Clevis..... G. H. Darrington
 Clock movement..... C. T. McClintock
 Clothes drying device..... A. M. Rollock
 Closet bowl and sink connection..... J. m. Hayden
 Clothes line hanger..... F. W. Stener
 Clothes line support..... F. Clark
 Clutch socket..... G. A. Harter
 Clutch..... B. F. Reichenberger
 Clutch. Magnetic..... A. Pick
 Clutch. Stay bolt..... W. Jones
 Clutching device..... F. Bailey et al
 Coal cutting machine..... F. Stiepel
 Cock and faucet..... A. Ullman
 Cock. Combined gage and stop..... H. J. Reynolds
 Cock for water heaters. Water..... R. C. Simpson
 Colander and cake pan. Combined..... C. W. G. Allender
 Collar fastening device. Lady's..... J. D. Lee
 Coloring and tanning apparatus..... C. I. Glase
 Comb..... J. G. Higgins
 Combustion. Conducting..... B. E. E'dred
 Combustion under pressure. Apparatus for generating and storing products of..... T. H. Cole
 Commutator switch..... E. B. Jacobson
 Compass handle adjusting device..... O. G. Mayer
 Concrete block machine..... W. W. Verner
 Concrete mixer..... C. L. Baldwin
 Concrete wall form..... O. F. Mann
 Condenser..... W. S. Johnson
 Condenser. Electric..... J. Mosicki
 Conduit. Frost proof..... H. H. Macomber
 Controller operating means..... A. J. Brown
 Conveying apparatus..... J. M. Hendricks
 Conveying loads between points of varying distance. Apparatus for..... W. Motter
 Copy holder attachment..... T. F. Ford
 Core drill..... R. M. Dowdle
 Corn cutting machine..... J. Schaubert
 Corn shucking mechanism..... J. E. Simmonds
 Cotton chopper..... D. A. Cable
 Cotton chopper..... J. H. Cline et al
 Coupling..... H. T. Ingham
 Cow tail holder..... A. R. Poundy
 Crate. Breeding..... L. C. Shepard
 Crate. Shipping..... C. W. Smith
 Cream separator bowl..... F. C. McMullen
 Cream separator. Centrifugal..... T. W. Morgan
 Cross tie and rail fastening. Combined..... E. T. Ford et al
 Crucible..... J. M. Allen
 Cultivator attachment..... F. S. & F. H. Beach
 Culverts and the like. Supporting structure for building..... E. F. Parcut
 Curling iron heater. Electric..... F. A. Tobler
 Curtain fastening device..... A. F. Bruckner et al
 Cushion..... H. S. Hale
 Cycle. Traveler's..... S. N. Polishock
 Deck chair and couch. Folding combination..... R. Osterberg
 Dental root impression and crown mounting instrument..... J. M. Evey
 Derrick. Top fitting for..... G. P. Wern
 Digging apparatus..... H. B. Arden
 Dipping tank..... A. A. Kramer
 Discharging apparatus. Rotary..... J. I. Power
 Disengageable coupling..... G. Leake
 Ditching machine..... T. Linga
 Ditching machine..... E. S. Boyd
 Door or sash lock..... W. H. McKeifer
 Doors. Device to open..... J. M. Young
 Draft rigging..... M. Kennedy
 Drill bit..... P. Broadbooks
 Drying kiln..... W. F. Stephens
 Duplicating machine..... G. H. Shannon
 Duplicating machine. Rotary..... G. L. Miller
 Dust collector..... P. C. Miller
 Dust from carpets, &c. Apparatus for the extraction of..... F. V. Schlot
 Dyeing machine..... I. R. Greenwood
 Electric apparatus supporting means..... E. G. Reed
 Electric apparatus. Vacuum tube..... D. M. Moore
 Electric conductor..... O. T. Hungerford
 Electric conductor or cable..... S. G. Brown
 Electric light fixture..... J. F. Barrett
 Electric machine. Dynamo..... I. A. Williams
 Electric machine. Dynamo..... W. J. Richards
 Electric machine with commutating poles. Dynamo..... H. R. King
 Electric wires. Branch conduit box for..... L. W. Bossert
 Electric wires. Pick up for non insulated..... E. J. Heath
 Electrical apparatus..... W. H. Thompson
 Electrical conductor and armor therefor..... C. J. Klein
 Electrical connections. Receptacle and plug for..... W. S. Mayer
 Electrical currents. Device for amplifying..... J. S. Stone

- Electrical cut off, Automatic... R. H. McDowell
Electrical distribution system... 2 pats... S. B. Storer
Electrical driving mechanism... G. C. Marx
Electrical switch... W. M. Scott
Electrically heated vessels. Safety attachment for... J. I. Ayer
Electricity from stock. Device for removing static... W. Fullard et al
Electrodes. Making storage battery... T. A. Edison
Electromagnetic means for transporting non-magnetic materials... E. I. Dodds
Electromotor of the induction type... F. M. Lewis
Elevator door connecting device... H. Butner
Elevators. Grain unloading sink for... F. R. McQueen
Energy. Generation and distribution of... J. F. Kelly
Engine coupling. Traction... W. F. Brown
Engine reversing gear. Gasoline... H. E. Zastrow et al
Engine starting device. Explosion... J. C. Hansen-Ellehammer
Engines. Electrical signaling apparatus for... G. J. Exterkamp
Envelope machine... G. W. Swilt, Jr.
Eraser. Rotatable... O. S. Pengerud
Excavator... H. W. Blaisdell
Expansion joint... W. W. Doolittle
Expansion joint... G. W. Hayden
Eye protector... E. Verdeau
Fan... H. E. Johnson
Faucet... C. Duerst
Feed. Apparatus for making molasses... S. L. Fraser
Feed water purifier... G. S. Garrett
Fence. Ornamental... J. Forster
Fence machine equalizer. Wire... S. S. Withington
File. Locking... W. G. Netheiry
Filing system. Credit account... E. J. Williams
Filter... T. W. Goreau
Filtering machine... J. Mills
Filtering material... G. M. Kuenper
Filtering material. Making... G. M. Kuenper
Fire escape... F. Jager
Fire extinguisher. Chemical... J. B. Thomas
Fire kindler... W. H. Haggerty et al
Firearm. Automatic... W. Mason
Firing gear... L. V. Benet et al
Floor, sidewalk, roof, and like support... P. H. Jackson
Fluid pressure brake... F. L. Clark et al
Fluid substances. Press for forming thick... C. F. Jr., & S. Mueller
Foot. Artificial... J. W. Mahaffey
Footwear. Wet proof... J. A. Kelly
Forebay construction... J. E. Sirrine
Forehead band... C. W. Maybey
Formaldehyde preparation... H. S. Blackmore
Forming machine... G. H. Petri
Fruit picker... M. B. Fields, Jr.
Failing mill... J. E. Dowd
Frame destroying composition... H. Sanborn
Furnace draft controlling device... G. R. McDermid et al
Furnace grate... E. Gibson
Furniture in rooms. Means for mounting... N. C. Merrill
Fuses or cut-outs. Indicating mechanism for electric... L. B. Buchanan
Game apparatus... W. W. Kohler
Game apparatus... L. D. H. Fuller
Game appliance... F. L. Stazenger
Garment supporter... F. J. Nardone
Gas analyzing apparatus... W. J. C. Ray
Gas boiler... C. Ray
Gas engine... W. H. Hooper et al
Gas engine... R. Levering
Gas. Generating producer... M. F. Mangelsdorff
Gas generator for fumigation... S. F. Aaron et al
Gas generator. Siphon... S. F. Aaron et al
Gas generator. Siphon feed... S. F. Aaron et al
Gas lighter. Electric... E. H. Pryce
Gasket... J. K. Whittemore
Gate... C. Mercer
Gate... H. Wells
Gear evener and power indicating means... M. I. Wilson
Gearing. Friction... J. F. Hink
Gearing shifting device... L. A. Frayer et al
Gem holder... M. Engelsman
Gin saw cleaner... J. C. Hollingsworth
Glass feeding machine... W. A. Mansfield
Glass melting furnace... C. F. Cox
Glassware manufacturing machine... A. S. Reichel
Glazier's tack... R. C. Zepnick
Governor... C. R. Cude
Governor. Engine... S. S. Hall
Grain assorter... J. K. & J. R. Voorhees
Grain cleaner and separator... T. M. Bales
Graining machine... F. I. Matthews
Grass cutter... C. F. Crosby
Grinding or surfacing calender bowls and the like. Apparatus for... J. Dronsfield
Gun barrels by fluid under pressure. Means for cleaning and cooling... A. G. Winter
Handling dirt and saving gold. Machine for... M. L. Proctor
Harness back band... B. W. Clendinen
Harness for producing free action of the limbs of horses... T. A. Shaver
Harvester. Bean... J. H. McEntire
Harvester. Corn... M. Cook
Hat fastener. Lady's... J. B. Marshall
Hat frame former... E. A. Howe
Hats. Guide for placing eyelets in... R. W. Fadden
Hay leveling device... C. Schutt
Hay loader... A. J. Hansen
Hay press... J. Christensen
Heat coil... F. B. Cook
Heater... C. H. Henzel
Heating system. Circulating hot water in a... C. C. Peck
Hedge trimmer... J. T. Newberry
Heel seat forming machine... S. J. Wentworth
Hide and leather working machine... H. A. Holder
Hinge... W. S. John
Hoisting bracket... P. A. Nelson
Hog stop and cattle pass. Combined... D. K. Wilson
Hoof pad... F. S. Handy et al
Hoof trimming device... B. Hackleby
Horseshoe... G. T. Crandell
Hose and hose pipe controlling nozzle... T. Haley
Husking peg... N. K. Smith et al
Hydraulic drill... J. Charlton
Hydrogen. Generating... C. Ellis et al
Ice cutting machine... W. H. Craghead
Impermeable, incombustible, insulating and acid proof material... U. A. Marga
Incubator regulator support... M. M. Johnson
Index machine... F. H. Schultz et al
Ink well... L. D. St. Clair
Inker... C. R. Spicer
Insulated electric conductor... O. T. Hungerford
Insulator... H. D. Stauffer
Ironing board and washbench. Combined... A. Schedlin
Ironing machine... L. Rosenbaum
Jar holder... H. Borneman
Junction or outlet box... L. W. Bossert
Ladder... C. De Cook
Lace... T. Anderson
Lamp burner... W. B. Grover
Lamp. Gas... R. E. Bruckner
Lamp. Vacuum tube. 2 pats... D. M. Moore
Lamps. Heating frame for... Z. L. Brooks
Larding needle... J. Snyder
Latch... H. G. Voight
Latch... C. J. Englelt
Latch and holder. Gate... J. Betts
Latch mechanism... H. G. Voight
Lathe carriage feed mechanism... W. Runge
Lathe for turning irregular shapes... M. H. Lyons
Laundry marker... G. L. Dixon
Leather clamp... C. B. Rathbun
Leather in different colors or shades. Dyeing granulated... G. Feldmann
Leather skiving and splitting machines. Feed mechanism for... A. Hirt
Leg supporter. Artificial... E. H. Erickson
Lens grinder. Bifocal... J. E. Graessle
Letter box... N. T. Cheney
Life lines. Means for throwing... C. H. Banks
Limit switch... G. Baehr
Lip turning machine... G. A. Hurley
Liquid dispensing apparatus... P. J. Flynn
Liquid dispensing apparatus. Coin controlled... J. J. Mackeown
Liquid heating system... J. C. Bartlett
Liquids. Separating... S. M. Kintner et al
Lithopones. Preparation of... R. Abbein
Loader... E. N. Smith
Locomotive buffer beam... C. T. Westlake
Locomotive safety device... T. H. Hale
Log hauler... A. O. Lombard
Loom warp stop motion... D. M. Hollins
Loom. Weft replenishing... H. Smith et al
Lubricator... E. K. Barnes
Lubricator... W. R. Eichens
Magnet box and armature of magnet contained therein... C. D. Lanning
Mail bag delivery apparatus... D. Smith
Mail box delivery apparatus... E. S. Baughman
Mail handling device for railway mail service... C. F. Robison
Malting grain... K. I. Somlo
Manifolding attachment... W. A. Rankin
Manifolding pad... S. W. Gass
Manila copal, &c., insoluble in oil. Rendering... W. Baringer
Massage machine. Pneumatic... A. A. Wickland
Match box... J. W. Hurd
Matrices. Master block for making... F. H. Brown et al
Matrices. Master block for producing... F. H. Brown et al
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Matrix making master block... F. H. Brown et al
Measuring device... W. C. Fogle
Measuring, winding and weighing machine. Combined... C. W. Cottrell
Mechanical motor... B. M. Ruse et al
Mechanical movement... F. H. Richards
Metal bending machine... C. E. Weeks
Metal. Manufacturer of cast... R. C. Totten
Metal sheets. Tinning or coating... L. C. Steele
Metallic oxides. Reducing... H. M. Beckett
Metallic tie and rail fastener... J. Fogbin et al
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Milk vat... G. H. Simon
Milking apparatus. Cow... J. Hartnett et al
Milking machine... L. Enrell
Miner's checks. Device for collecting... F. C. Greene
Mining drill... W. Hauxwell
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Mold... J. F. Hilt et al
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Mold and centering device... J. B. Blaw
Molding machines... E. L. Dawes et al
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Mower attachment. Lawn... M. Ketcher
Music rack and leaf turner. Combined... H. E. Van Vleck
Musical instruments. Controlling device for automatic... G. H. Davis
Nail driver... H. W. Sheve
Name plate and register for doors. Combined... J. H. Paige
Neckwear... J. W. Frost
Nest... C. C. Ison
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Note sheets. Marking for... P. K. Van York
Nozzle holder... J. H. Ruff
Nut lock... G. C. Wooddell
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Oil burner... H. E. Armaltage
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Ordnance sighting apparatus... L. V. Benet et al
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Ores. Preparing and reducing... E. Pollack
Outlet box... 2 pats... L. T. La Paugh
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Packing... C. B. Shepard
Packing former and replacer. Piston... J. J. Hannon
Packing. Conical ring rod... T. W. Mitchell
Packing. Hydraulic... C. F. Rigby
Packing or gasket... E. L. Perry
Packing. Metallic... W. M. Brooke
Packing. Rod... O. J. Garlock
Paint for ships' bottoms... G. G. Schobert
Painter's utensil... C. Fischer
Panel boards and the like. Construction for... H. Krantz
Paper measuring and cutting machine... H. W. Sanderson
Paper treating composition... J. Czerny
Pattens and the like on tresses. Production of transparent... A. Gehler
Peeling apparatus. Vegetable... W. L. Weber
Pen and pencil holder... F. L. Benstead
Pen clip or sustaining device. Fountain... A. Martinelli
Pen. Drawing... O. G. Mayer
Penetrator... H. A. Steiner
Pen. Fountain... H. B. Levy
Pen. Fountain... W. C. Luther
Pen or pencil clip... V. L. Ochoa
Pencil... J. D. R. Lamson
Pencil holder and point protector... R. Klipfel
Pencil holding device... H. L. Patzold
Pencils. Eraser holder for lead... B. B. Goldsmith
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Perambulator... A. Kazmeier
Permutation lock... J. J. Murphy
Pessary... L. Nelson
Phonograph record holder... T. V. Skelly
Phonograph system... W. & J. Patten
Photographic developing machine... F. A. Brownell
Photographic printing machine... J. C. Calhoun
Photographic shutter... M. Kaiber
Piano action... J. H. Deutsch
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Pianos. Repeating action for upright... C. Santer
Picture exhibiting apparatus. Moving... F. L. Dyer et al
Pie trimming and crimping machine. Automatic... C. Oskamp
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Planing machine feed roll. Wood... C. E. Harper
Planting mechanism... N. B. Hodge
Pliers. Jeweler's cutting... H. B. Rowan
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Poke. Animal... J. F. Carter
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Portable chair... E. Domsen et al
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Power transmitting device... D. S. Seymour
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Printing plate... 2 pats... E. Spitzer
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Propeller... J. Bernes
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Propeller, motor, pump, or blowing engines. Machine for revolving wings or blades, applicable either as... H. Huckel
Pump... F. G. Hobart
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Pump operating means... E. O. Smith
Pump piston... C. M. Ray
Punch. Pocket check... R. W. Cox et al
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Punching press. Sheet metal... J. A. Eden, Jr.
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Rail anticreep... N. E. Salsich
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Rail bonds. Manufacture of... G. A. Mead
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Razor. Safety... W. H. G. King
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Razor stropping machine... E. C. Bowden-Smith
Regulator... R. D. Wirt
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Rotary engine... L. K. Sivertson
Rotary engine... T. S. Barwis
Rotary engine... A. Ghira
Rotary engine... J. E. Friend
Ruler. Desk... H. F. Beicher
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Salts of volatile bases. Producing... T. Blass et al
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Sash. Metallic window... C. & O. A. Neidig
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Sawing machines. Self feed for mortise and tenon... J. E. Erickson
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Scaffold bracket. Folding... F. F. Haskell
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Seed hull delinting machine. Cotton... W. O'iver
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Sheet feeding machine... F. L. Cross
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Sheet separating mechanism... J. P. Knapp
Sheets. Controlling mechanism for machine acting on... 2 pats... F. L. Cross
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Shuttle... J. Robinson
Silo... G. P. Youmans
Sign. Mechanically operated... J. A. Weidemann
Signals. Clock mechanism for... F. O. Warner
Signaling device. Torpedo... E. E. Blain
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Skirt bottom turning device... M. A. Kelly
Skirt or attachment therefor... W. Padernacht
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Spark arrester... A. Ballewski et al
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Sprayer... F. G. Hobart
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Stairway... C. E. Paulson
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Steam generator fuel regulation system... H. Lemp
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Street indicator... J. H. Goodier
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Tag machine... H. Shoemaker
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Telegraph transmitter... J. Barry
Telephone exchange apparatus... C. D. Enoch
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Telephone installations. Automatic switch for... P. Hildebrand
Telephone set. Portable combination... A. Stromberg
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Telephone system. Party line... G. E. Treharne et al
Telephone system. Trunk line... W. W. Dean
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Telephone transmitters. Sanitary attachment for... J. W. Dolson
Tellurian... C. B. Martin
Temperature regulator... F. Darlington
Tennis. &c. Racket for... H. S. Brown
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Thread cutter... A. Karrer
Ticket issuing and recording machine... J. F. Ohmer et al
Tiles, glass, &c. Means or apparatus for burning or fixing the colors upon printed or decorated... L. W. Stanley
Time recorder... J. Ericson
Tire case... F. B. Hopewell
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Tire. Laminated... J. W. Carhart
Tire or other valve... M. C. Schwenert et al
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Tobacco. Bag for pulverizing slice plug cut... G. S. Ross
Tobacco boiler... R. E. Anger
Tool holder... C. W. Meadowcroft, Sr.
Tool holder... M. D. Reidy
Tool. Machine... A. Wood
Tool. Portable pneumatic... C. H. Haeseler et al
Tools. Danger signal for portable electric... J. I. Ayer
Tooth crown model... C. F. Lauderdale
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Track cleaner... D. R. Edwards
Track shifting machine... W. G. Bied
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Transformer cooling means... F. Darlington
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Transmitting mechanism... J. A. Papot
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Trolley wheels. Casting... F. B. Torrey
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Truck bolster. Car... G. A. Johnson
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Trucks. Brake mechanism for pivoted car... W. L. Anstin
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Type matrix... F. H. Brown et al
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Vegetable cutter... R. A. Baggett
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Vehicle brake... O. Schnitz
Vehicle, Motor... B. D. Drnen
Vehicle Motor... G. Rothgiesser
Vehicle speed gear, Motor... T. H. Bastin
Vehicle steering gear... J. T. Girard
Vehicle wheel... E. F. Krell
Vehicle wheel... J. Nash
Vehicles, &c. Gearing for motor... M. Pedersen
Vehicles. Sighting apparatus for moving... W. H. Robertson
Vending machine... C. C. Inman
Veneers. Machine for cutting barrel... F. Thornton
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Voting machine... C. L. Lorraine
Wagon, Dump... C. A. Geiger
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Wagon loader... C. A. Jose
Wagon reel... E. B. Curtis
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Watch protector... S. Golombek
Water. Apparatus for the treatment of... R. T. Weaver
Water closet bowl... G. W. Knapp
Water closet ventilating device... A. T. Lueckenbach
Water colors. Composition of... R. W. Cornelison
Water distributing apparatus... H. M. Sanders
Water elevator and carrier... W. C. Day
Water purifying apparatus. Feeding device for... M. F. Newman
Watering device... A. J. Vorheis et al
Wave power motor... F. Danford
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Wheel... J. Thomson et al
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Window, Detachable bay... L. G. Quackenbush
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Wire knotting machine... E. A. Hoefler
Wire reel... C. W. Stark
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Woodworking machines. Saw or cutter guard for... E. W. A. Holtz et al
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Woven fabric... J. E. Kerr
Wrapper cutting and registering apparatus... J. H. Brady
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Yoke and yoke screw... C. T. Mapes

DESIGNS.

Horn... L. L. Terhune
Reflector... A. J. Morgan
Ribbon... E. M. Corbett
Tiling... A. A. Spadone
Tube, Collapsible... W. H. Blood, Jr.
Watch pendant... L. E. F. Wachter

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Addressing machines. Galley for... S. C. Cox
Advertising device... G. L. Thorne
Agricultural implement... J. J. Huft
Air brake... T. H. Van Dyke
Air brake hose coupling... O. I. Goldsmith
Amusement device... F. P. Inman et al
Anchor, Earth... C. E. Krost
Animal trap... F. R. Baker
Animal trap... J. W. Collins
Armature for dynamo-electric machines... B. G. Lamme
Armillary sphere... F. L. Bryant
Ash screener... H. Platt
Automobile attachment... S. T. Beal
Automobile folding seat... J. M. Nolan
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Automobile starting device... R. B. Waite
Automobiles. Handhold strap for... C. S. MacMullan
Automobiles. Handhold strap for... J. R. Scott
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Baling press... E. H. McMurray
Banding machine... T. A. Sizemore
Barrel elevator and trip... B. F. Sommers
Bath tub trap... T. E. Logan
Batteries. Flexible electric connection for storage... B. Ford
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Bean picking machine... G. F. Crippen
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Bearing. Roller... E. Geschke
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Bed and couch. Combined... D. T. Owen
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Beehive... O. L. Herzhiser
Belt holding device... J. J. Sheridan
Belt tightening idler... G. S. Dunn
Bench... P. A. Cogan
Bevel, protractor, and square... T. W. Spellman
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Binder. Loose leaf... F. H. Cramp
Binder. Temporary... E. E. Clark
Bit holder. Adjustable extension... C. E. Hill
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Boiler furnace... D. Vines
Boiler tubes. Device for removing scale from... J. Georges et al
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Books. Flat opening leaf for... J. J. Diehl
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Bottle and the like closure... F. T. Robinson
Bottle washing machine... J. R. Amacker
Box cover opener... J. Johnston
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Brake... R. W. Bainbridge
Brake apparatus. High speed... J. W. Cloud
Brake apparatus. Load... C. C. Farmer
Brake shoe... W. G. Grant
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Brake shoe and head. Separable... C. A. Remelins
Brick kiln... B. F. Canavera
Brick molding machine... N. H. Bolten et al
Brick press... G. W. Balkwill
Brick machine... D. E. Bangs
Broom handle... S. G. Wilson
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Rucket joint. Dredge... A. T. Fraser
Buckle... R. C. Kirby
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Building block... S. Crittenden
Building block and wall... W. Carlett
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Burial casket... A. J. Meikelbach
Butcher's chopping block... F. J. Schmitt
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Butter mold... C. A. & L. F. Crane et al
Button or stud... C. E. Hansen
Calendar, Perpetual... W. J. Hartman
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Cultivator. Lister... A. E. Wilsbushen
Cultivator. Wheeled... J. E. Miller
Current apparatus. Alternating... R. D. Mershon
Current motor... E. P. Couture
Current motor. Alternating... L. A. Hawkins
Current motor. Alternating... M. C. A. Latour
Current motor. Water... J. A. Cameron
Curtain fastening... J. Schneider
Curtain fixture... F. Herbeck
Curtain operator... W. L. Osborn
Cuspidor. Sanitary... A. Fishman
Cut out... J. T. Marshall
Cycles, &c. Stand for motor... J. J. Hansel
Demagnetizer... D. M. Bliss
Dental engine handpiece... F. W. Dean
Dish and drip pan. Combined... D. E. Bonathan
Display case... B. P. Ramsey
Display device. Adjustable shoe... W. F. Spicer
Display rack and meat hanger. Refrigerator... H. L. Crawford
Display stand... H. H. Fack
Distilling apparatus. Wood... A. J. McArthur
Ditch leveling device... S. E. Stoner
Door hanger... H. C. Smith
Door hanger and means to prevent the swaying of doors... J. Woyak
Door hanger and track therefor... J. Handschumacher
Door lock... T. B. Jack
Draft equalizer... W. P. Wild
Draft equalizer... B. J. Brunke
Drawer construction for furniture. Sliding... T. J. Amberg
Drinking fountain... F. L. McNitt
Dumping body... W. R. Goit
Dust remover. Pneumatic... M. E. Freeman
Dye. Making anthracene... M. Isler
Dynamometer... W. F. Dawson
Dynamometer... C. M. Garland
Earth scraping machine... W. J. Randall
Eccentric... R. M. Clark
Electric attachment for movable objects... J. R. Dawkins
Electric current controlling device... H. B. Emerson et al
Electric governor... H. Weber
Electric heater or rheostat... F. C. Newell
Electric machine. Dynamo... W. M. Coffman
Electric machine. Dynamo... J. E. Noeggerath
Electric machine. Dynamo... L. E. Underwood
Electric machine. Dynamo... J. B. Wiard
Electric machines. Reversing the polarity of dynamo... J. B. Taylor
Electric meter... E. Thomson
Electric meter... R. Arno
Electric motor control system... H. D. James
Electric motor controller... F. H. Burmeister
Electrical distribution system... J. L. Woodbridge
Electrical sockets and conduits. Connection for... R. B. Benjamin
Electrically actuated body. Means of control for an... B. McInerney
Electrolytic diaphragm and making same... L. H. Baekeland
Electromagnetically actuated device... R. P. Jackson
Electrotype or the like... E. A. Fallier
Elevator... D. C. Snippe
Elevator shafts. Automatic door closer for... E. E. Ashby
Elevator valve mechanism... R. C. Bromley
Embroidery in divers cords... F. Bandenon
Embroidery machines. Fabric frame moving mechanism for... W. L. De Bar
Engine... A. Klose
Engine ignition device. Explosive... J. Stadtherr
Engines and making same. Radiator for explosive... J. F. Faries
Engines. Apparatus for muffling the exhaust of gas... E. Thomson
Envelop feeder... C. E. Johnson
Excavating and elevating apparatus... F. E. Allen
Excavating machine... J. D. Buchanan
Excavator... O. & W. K. Streng
Explosives in wells. Apparatus for firing... L. H. Broadwater
Fan and eye protector. Combined... T. Ritter
Farrier's tool... W. Lyons
Fastening device... F. Ranpach
Fastening hook... B. Knothe
Feed apparatus. Intermittent... B. Baron
Feed bag... S. F. Mainster et al
Feeding device for horses. Slow... C. E. Seymour
Fence lock. Wire... I. R. Hill
Fence machines. Crimping mechanism for wire... J. A. Croker
Filter... E. M. Wade
Filter. Liquid... H. J. Hass
Fire escape apparatus... C. W. Bergquist
Fire glazing machine... M. J. Owens
Fire polishing machine... W. E. Bock
Firearm. Automatic... C. A. Strasburg
Fireproof material... K. Sakurai
Firing mechanism. Electric and percussion... W. H. Bevans
Fish net float... J. Koenig
Flanged pipe... L. H. Brinkman
Flash light... G. F. Ehemann
Fine beater tool... L. A. Tinnis
Flue cleaners. Turbine for... T. Coates
Flue stopper... J. W. De Weese
Fly trap... I. Hansen
Fly trap for attachment to windows... W. J. Posakony
Food and making same. Castle... G. F. Ahlers
Force feed lubricator... C. B. Hodges
Fork and spoon. Combined... J. King
Fruit picker... L. A. Sample
Funnel... E. L. F. Fraley
Furnace... M. V. Smith
Furnace... A. Ducco
Furnace feed... G. C. Crow
Furnace for heating disk wheels or the like... A. Wiecke
Furnaces. Apparatus for burning fuel in... E. M. Runce
Fuse. Time... C. Baker

Game apparatus... E. C. D'Yarmett
Game apparatus... F. R. Kistler
Gas absorber... F. W. Allan
Gas. Apparatus for charging liquids with carbonic acid... F. D. Green et al
Gas engine... W. F. Brehm
Gas engine... J. H. & J. H. Birch
Gas Manufacturing... J. J. Busenberz
Gearing... J. Parker
Gearing. Speed changing... L. E. Lincoln
Glass making machine. Sheet or plate... W. W. W. Keyes
Glassware manufacturing apparatus... J. Shies
Gold from magnetic sands. Apparatus for separating... E. Gates
Golf club... W. R. Orthwein
Grading machine for building and repairing roads... W. A. Jones
Grain and seed cleaner... H. H. Dunning
Grain cleaner... J. H. Peacock
Grain drier... J. A. Higdon
Graining metallic plates. Apparatus for... C. M. Kneopler
Grave covering device... A. McMullen
Grinding machines. Eccentric work holder for... A. B. Landis
Grinding mill... J. F. Winchell
Grinding mill quick release... A. J. Robinson
Grinding mill. Vertical disk... A. M. Dellinger
Gun sight devices, &c. Screw gear for... O. Granhering
Gun stock... P. H. Clarisey
Gun. Take down... T. C. Johnson
Gun with recoiling barrel... K. Voller
Guy wire fastener... A. Bearse
Hair curling device... F. C. Grocott
Hair pin... F. J. Mooers
Hair tonic and dandruff preventive... F. W. Brock
Hammer attachment... W. H. Smalley
Hammer. Forged steel... W. S. Ward
Hammer. Power... L. Wilson et al
Hammer retracting device... H. W. Bull
Hand. Apparatus for delineating character according to the character of the... H. N. Marvin et al
Harness. Breast chain spreader for... J. W. Wistar
Harvesting binding mechanism. Corn... W. H. Tillson
Hasp lock... W. K. Blodgett
Hat fastener... J. C. Morfison
Hat holder and band... W. A. Pierce
Hat holding device... W. H. Burden
Hat pin fastener... J. W. Cunningham
Hay dropper... W. A. Cook
Hay loader... J. N. Jeppesen
Hay press... J. W. Hamilton
Hay rake... M. R. Jenkins
Headlight attachment... C. T. McElvane
Headlight. Locomotive... W. H. Donaldson
Heating system... J. F. Standt
Hoisting mechanism... A. A. McIntosh
Hoof pad... A. Larsen
Horse power... W. D. McAttila
Horse releaser... M. L. Swingle
Horseshoe calk... G. F. Hallman et al
Horseshoe calks. Making... R. Whitaker
Horseshoe. Cushioned... W. R. Smith
Hose coupling... C. C. Corlew
Hydrant... J. W. Singmaster
Hydrocarbon motor... A. A. Low
Ice cream freezer... F. Tyson
Ice tongs... W. T. McNabb et al
Igniter. Electric... A. D. Wilkinson
Incubators. Automatic ventilation regulator for... A. E. Leavenworth
Induction motor... H. G. Reist
Injector... W. H. Wicks
Inkstand... T. H. Newman
Insole for shoes. Spring... C. J. Cotter
Insulating wire and other electrical conductors. Electrically... A. D. Whipple
Insulation. Fuse box of molded A. C. Save
Insulator... H. Sinclair
Insulator. High potential... L. Steinberger
Insulator pin... W. S. Lee, Jr.
Insulator pin... L. Steinberger
Insulator. Spiral core... L. Steinberger
Internal combustion engine... P. Metzler
Internal combustion engine... F. Morey
Joint marking tool... J. B. Colburn
Journal box... F. Hachmann
Journal box lid... T. H. Symington
Journal box. Railway... T. H. Symington
Knife... R. A. Baggett
Knitted undergarment... O. McAdam
Knitting machine... A. V. Gronpe
Knitting machine yarn measuring and feeding device... D. Hurley et al
Lamp bracket... P. M. Wickstrum
Lamp burner... A. H. Hanlan, Jr.
Lamp. Gas... A. H. Humphrey
Lamp. Three phase current. Arc... G. Semeza
Lamps and similar objects. Suspending device for electric arc... E. Kuhn
Lamps. Manufacture of incandescent bodies for electric... A. Just et al
Land roller... B. A. Thomas
Lantern slide and mat therefor... L. M. McCormick
Lasts. Bushing or thimble for... B. E. Howe
Latch lock... H. Schmitt
Lathe... G. M. Fend et al
Leather dressing machine... W. R. Turner
Leather polish... J. Newberry
Ledge leaf... J. Barker
Life preserver... K. I. Johansson
Lifting jack... W. Orstorn et al
Lightning arrester... W. Gifford
Link... W. A. Duffield
Liquid separator. Centrifugal... B. Ljungstrom
Loading and unloading apparatus... A. R. Holmen
Lock... F. X. Eckstein
Locomotive with steam turbine drive... J. Stumpf
Log car door... J. Hanley
Loom warp stop motion... C. Adams
Loom with swinging front plate for the shuttle box. Shuttle changing... E. S. Stimpson
Looms. Multiplier mechanism for box... G. R. Forbes et al
Lubricating device... J. S. Coates et al
Lubricating means... E. M. Williamson et al
Lubricator... J. E. Crandall
Macroni, &c. Machine for manufacturing... J. V. Ebel

Mail chute R. W. Ashley
Manure fork W. H. Compton
Manure spreader E. Palm
Mason's pointing tool A. Eide
Massage machine R. V. Clark
Mast hoop P. J. Hansen
Match box W. E. Edwards
Match lighter J. G. McCarthy
Match machine J. S. Woodbridge
Match making machinery 2 pats.
..... A. B. Calkins
Mattress frame R. W. Miller
Measuring apparatus, Tailor's J. Barnett
Measuring instrument E. Schaeffer
Measuring instrument, Electrical
..... J. Abrahamson
Metal, Reticulated N. E. Clark
Metals from their ores, Extracting
..... W. L. George
Meter connection A. L. Holmes
Milk cooler and aerator C. H. White et al
Mining auger C. C. Lockhart
Mining machine, Portable placer
..... J. E. Pennick et al
Mold P. A. Bowsher
Mold preparing machine L. P. Dages
Motion or power, Means for imparting
..... J. Thomas
Motor control M. W. Day
Motor control device A. Kidd, Jr
Motor generator sets, Equalizing loads on
..... J. B. Taylor
Motors at a distance, Controlling N. C. Bassett
Month brace H. Lorenz
Movement cure device L. E. Richmond
Music sheet W. H. Rees
Musical instrument controller, Mechanical
..... J. W. Sutton
Musical instruments, Music roll for mechanical
..... H. P. Bail
Nut lock H. M. Cheek et al
Nut lock W. H. Phillips
Nut lock E. J. Foreman
Nut lock G. W. Mims
Nutmeg pulverizer G. A. Aiger
Oil check for lubricator drain passages, Automatic
..... W. E. Bryant
Oils and fats with heavier fluids, Combining
..... T. E. Smith
Oiler, Multiple sight feed G. B. Essex
Oiler, Windmill L. C. Pond et al
Oiling machine, Fiber F. Spivey
Opticians' use, Trial frame for
..... J. W. C. Smith
Ore roasting furnace W. H. Smyth
Ore separator, Magnetic E. A. Edwards
Outlet box, Adjustable M. D. Baron
Oxids, Production of active matter for accumulators with mixed
..... H. Fredet
Oyster dredge hoist J. P. Kemp
Ozonizer H. N. Potter
Packing and display device S. R. Slaymaker
Packing strips, Machine for making
..... W. Dichmann
Painted, Stand for revolvably supporting articles to be
..... J. S. Anthony, Jr
Paper cutter attachment, Roll F. H. Maass
Paper hanger's trimmer E. E. Goble
Paper hanging machine A. V. Austin et al
Paper pads and books, Flexible back for
..... J. Macnaman
Paste jar R. Brooks
Pencil sharpener W. A. Schenck
Pen holder L. G. McConkey
Perforating machine A. L. Hart
Phonograph record blanks, Manufacture of cylindrical
..... V. M. Harris
Phonograph records, Molding V. M. Harris
Phonograph records, Molding V. M. Harris
Photographic developing and fixing apparatus
..... A. C. Hayden
Piano, Automatic J. A. Weser
Piano, Bell F. Hirschfeld
Piano case, Upright F. T. Steinway
Piano, Self playing J. J. Healy
Piano zither J. J. Healy
Picture, Mechanical changeable W. H. Hoyt
Pigments, Regenerating waste liquors from the manufacture of chrome
..... A. S. Ramage
Pie fabric J. Zimmerman
Piling, Metal sheet J. K. Wemlinger
Pipe coupling, Bell and spigot S. R. Dresser
Pipe pattern H. Slade
Pipe wrench E. C. Bates
Piston ring expander O. Winter
Pistons, Automatic stop for E. C. Thorschmidt
Pivotal member C. Aalborg
Planing and sandpapering machine, Floor
..... G. J. Keppinger
Planter, Check row corn E. Robinson
Plastic block mold H. A. Zarbuch
Plating separating device P. K. Greist
Plow R. A. Armstrong
Plow and roller, Furrow C. E. Holbrook
Plow attachment C. L. Polk
Plow handles to beams, Means for attaching
..... T. M. Manning
Plow heel, Adjustable G. W. Simmons
Plow, Sulky W. S. Graham
Plumb bob A. J. Crockett
Pocket and other case, 2 pats. W. E. Edwards
Pool ball frame T. H. Canahan
Portable elevator, Revolving J. McCarthy
Post and show window fastener, Expansion
..... G. C. Marr
Post forming device W. E. Snyder
Postmarking and canceling machine
..... M. V. B. Ethridge
Potential regulator E. Lehi
Power system G. Y. Bonus
Power transmission mechanism
..... C. Macmillan
Printing frame W. B. Young
Printing press perforating and creasing attachment
..... H. G. Razall
Propeller, Screw W. Pre del
Propelling and steering device, Vessel
..... W. O. Cutter
Pulley, Split E. Dietrich
Pulp or liquid distributor, Revolving
..... E. H. Moyle
Pump C. Bartholomew
Pump, Air M. Kohl
Pump, Direct acting W. Weir
Pump governor C. R. Moore
Pump, Measuring T. Hentgen
Pump valve and cap, Combined A. R. Foley
Puzzle G. A. Davis
Puzzle W. D. McMillan

Puzzle W. S. Watson et al
Quadrat J. S. Duncan et al
Raising appliance, Log M. F. Brown
Rail brace M. L. Swingle
Rail fastening C. H. Ewing
Rail joint A. L. Stanford
Rail splice J. Thomas
Railway rail fastener W. S. Glasgow
Railway signal B. & D. Samuels
Railway signaling system, Electric
..... A. Casale
Railway switch J. Haime
Railway switch E. Norden
Railway switch A. W. Barthel
Railway switch U. A. Woodbury
Railway switch, Automatic street
..... J. A. Bequist
Railway tie J. A. Willis
Railway tie R. L. Bower
Railway tie and rail fastener F. C. Evans
Railway track rails, Bridle rod for
..... H. W. Freeman
Railway train shed A. L. Bush
Railways, Strain adjuster for contract wires of electric
..... J. Mayer
Railways, Superstructure for narrow gauge
..... F. Neilen
Railways, Suspender for the contract wires of electric
..... J. Mayer
Ramrod H. P. Fitzgerald
Ratchet mechanism R. C. Ellrich
Razor T. C. Durham
Razor 3 pats. S. I. Prescott
Razor blade holder C. W. Speece
Razor, Safety E. Krusius
Relay E. W. Vogel
Relay, Reverse phase E. M. Hewitt
Resistance unit F. Macintosh
Reversing switch C. A. Fustian
Roller mount C. Leonard-Stuart
Rolling pin A. Catlin
Roofing, Composite A. G. Hennion
Rope fastening or button T. S. Miller et al
Rotary engine G. Voith
Rotary engine H. A. Seitz
Rotary engine G. A. Kelly
Rotary engine J. C. Walker
Rotary engine, 2 pats. J. M. Sparks
Rotary engine S. F. Van Choate
Rotary screen, ore sizer and sampler
..... H. G. King
Roundabout J. D. Walsh
Sail reefing apparatus J. V. Ericson
Salt and pepper shaker A. L. Buckland
Salt cellar top, Flexible F. Bartlett
Sand box P. S. Keck
Sash fastener C. E. Thomas
Sash, Removable guide for metal window
..... F. D. Swaney
Saw tooth gage L. M. Taylor
Scaffold, Adjustable W. J. Murray
Screw driver and combined tool holder, Interchangeable and adjustable
..... V. E. Campbell
Seal for bottles, Frangible F. T. Robinson
Seal lock A. D. Bentley
Sealing cap, Metal C. C. Parker
Seaming machine, Can E. P. Datow
Seaming machine, Lock A. D. Coleman et al
Sewing machine, Buttonhole J. Kiewicz
Sewing machine gage D. Dantzig et al
Sewing machine hemmer J. M. Greist
Sewing machine tuck creaser P. R. Greist
Shade and curtain hanger G. L. Brewer
Shade roller, Window J. Dudgey
Shade support, Window C. C. Brown
Shaft, Flexible link E. Hensel
Shaking table separator F. T. Snyder
Sharpener, Band cutter C. N. Detwiler
Shears C. B. Klein
Sheet metal can F. Westerbeck
Ship construction W. I. Babcock
Shirt waist attachment N. E. Hanna
Shoe stretcher N. A. Lybeck
Shoe, Swimming R. G. Ayers
Shovel tooth J. A. Parsons
Sign P. Elieau
Signaling key O. F. Frosberg et al
Skating rink F. L. Oleson
Sled propeller J. J. Hansel
Smoke preventer J. Boyd
Snap hook T. Watson
Soap holder S. E. Bishop
Soap or other material, Cooling frame for
..... A. E. Boardman
Soap shaving device F. Egge
Sole edge trimmer W. F. Reulmann
Sound records, Composition of matter for
..... G. K. Cheney
Spike S. C. Kindig
Spring for beds, seat bottoms, &c
..... T. R. Woodward
Spring wheel S. S. Childs
Spring wheel, 2 pats. J. W. Cooper
Sprinkler alarm device E. L. Tompson
Sprinkler heads, Hood for automatic
..... J. C. Scott
Square D. S. Cormier
Square, Carpenter's J. A. McCloskey
Stable floors, Basin or trap for
..... M. J. O'Brien
Stacker, Hay M. R. Jenkins
Stacker, Hay W. E. Carter
Stamp, Binder's J. Henry
Stamp mill G. Coon
Stanchion A. W. Reeves
Station indicator A. J. Grunert et al
Station indicator J. Kuntson
Stationery box C. W. Cook
Stay and fastener, Skirt W. H. Regner
Stay, Garment H. L. Gregg
Steam generator T. F. Scollard
Steam trap H. Ritter
Steering device W. E. Geyer
Stitch machine, Impression J. B. Hadaway
Stone turning and cutting machine
..... J. S. Detrick et al
Stove grate F. P. Soupeset
Stovepipe elbow J. A. Doree
Stovepipe fastener B. C. Brown
Stovepipe lock T. Mosley
Strap splicer F. M. Hall
Sulfids, Reducing metallic F. M. Becket
Surveying instrument A. A. Brothen
Suspender clasp W. Pigott
Suspenders S. W. Phelps
Switch frogs, guard rails or the like, Guard for
..... A. Anderson
Switch stand F. W. Snow et al
Swiveled base J. G. Corbett

Talking machine attachment C. M. Miller
Talking machine sound box E. H. Mobley
Telegraph key B. F. Bellows
Telegraph system, Wireless H. B. C. Dunwoody
Telegraph, telephone, or other wires and ropes, Cross arm for carrying
..... H. M. Sciple
Telephone O. F. Falk
Telephone attachment E. B. Thomas
Telephone lines, Combined annunciator and ringer for
..... H. Tideman
Telephone switchboard J. M. Dosbaugh
Telephone systems, Call register for
..... R. H. Manson
Telephone transmitter O. F. Falk
Telephone wires, Apparatus for testing
..... J. M. Miller et al
Templet A. D. McAllen et al
Test meter, Portable C. H. Evers
Thermal cut out, 2 pats. J. T. H. Dempster
Thread cutting machine T. B. Earhart
Thread guide G. Singleton
Thread, yarn, &c, Guide for J. R. Mitchell
Threshing machine grain feeding apparatus
..... J. B. Bartholomew
Tiles, Manufacturing roofing R. Hedrich
Time controlling mechanism P. W. James
Tire T. F. Sobers
Tire pump W. S. Stapley
Tool, Combination D. B. Huffman
Tool, Combination B. F. Bird
Tool, Combination M. C. Raymond
Tooth, Artificial J. Ramsperger
Toy savings bank H. C. Lampe, Jr
Transformer, High voltage J. B. Taylor
Transom lifter L. C. Smith
Trolley pole L. Radcliff
Trolley wheel J. C. Cordrey et al
Truck P. Kerrigan
Tunnel ventilating apparatus C. A. Morris
Tunnels, Ventilating C. A. Morris
Turbine, Steam R. Wilson
Type casting machine mold
..... F. H. Brown et al
Typewriter attachment H. B. Kiebig
Typewriting machine, 2 pats. A. F. Lear
Typewriting machine H. L. Wagner
Typewriting machine, 2 pats. C. H. Shepard
Umbrella, Folding A. Steininger
Umbrella, Folding J. Q. Adams, Sr
Undergarment J. A. Scriven
Undergarment R. M. Appleton
Valve C. O. Churchill
Valve B. O. Yearwood
Valve for automatic sprinkler systems, Dry pipe
..... E. L. Thompson
Valve gear for gas engines or motors
..... F. A. Thomas
Valve, Hydraulic J. H. Allendorfer
Valve mechanism for boilers, Fluid pressure operated stop
..... H. R. Rockwell
Valve mechanism for engines, Fluid pressure operated stop, 3 pats.
..... H. R. Rockwell
Valve Safety J. C. Pogue
Valve Safety J. M. Coase
Valves, Tool for removing engine
..... C. F. Weeber
Vehicle C. H. Kramer
Vehicle curtains and the like, Fastener for
..... J. M. Walsh
Vehicle draft attachment J. M. Sudduth
Vehicle dumping device M. I. Tuttle
Vehicle wheel R. T. Smith, Jr
Vehicle wheel, Resilient J. Partington
Vending machine J. P. Conroy
Vending machine, Coin operated
..... G. T. Haines
Vessel, Metallic C. L. Coffin
Vessels, &c, Attachment for P. H. Null
Veterinary appliance G. P. Johnson
Veterinary surgical instrument C. F. Martin
Veterinary tooth cutter or dental float
..... C. F. Martin
Violin, Electric self playing H. K. Sandell
Viscose, Manufacture of M. Waddell
Voting machine A. McKenzie
Wagon draft device G. F. Shaw
Wagon, Dumping R. G. & L. Cator
Wagon, Dumping R. S. C. Fow
Wagon or go-cart, Baby F. H. Grimmer
Wall, Building W. Curlett
Wall plug F. J. Plym
Warp holder or sustainer A. C. Schoen
Watchmaker's roller and collet resetter tool
..... J. W. Goucher
Water elevating and storage apparatus
..... W. W. Douglass
Water heater P. G. Olds
Water heater A. Oleson et al
Water meter E. E. Gamon
Water meter, Tamper proof C. E. Loetzer
Wave motor J. W. Neal
Weather strip J. Lutz et al
Weather strip and guide, Combined
..... W. H. Etter
Welts to stock, Machine for uniting
..... H. C. Gros
Wheel spindle P. H. Graves
Wheels, Assembling J. Weber, Jr
Wheelbarrow C. H. Heineman
Windmill governor C. K. Hall
Window O. M. Edwards
Window fastener, Storm E. C. Richards
Window screen W. Kemmerling
Window sill, Weatherproof P. L. Hedberg
Wire coiling apparatus F. H. Daniels
Wire rod treating apparatus F. H. Daniels
Wire rods, Manufacture of F. H. Daniels
Wire rods, Treatment of F. H. Daniels
Wire working tool J. F. Dixon
Woodworking tool N. H. Devers
Wrench G. K. Holbine
Wrench W. McGlone
Wrench J. B. Runner
Wrench J. M. Wallace
Yeast, Manufacturing J. Blumer
Yoke, Animal P. W. Whelden

DESIGNS.

Badge M. H. Goodrich
Brushes, hand mirrors, and similar articles, Back of hair
..... G. F. Kolb
Cabinet A. Famulattis
Fabric, Printed V. Burschel
Fabric, Textile, 3 pats. H. W. Fowler
Fabric, Textile E. Humphreys
Fabric, Textile A. F. Papin
Fabric, Textile, 2 pats. O. C. Sauer
Paper, Writing and printing J. P. Phelps

Photo mount H. W. Simpson
Spoons, forks, or similar articles, Handle for
..... F. Habensack
Wall covering J. J. Plucker

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MECHANICAL PATENTS.

Accounting device, Credit M. E. Gibson
Acid concentrating apparatus, Sulfuric
..... A. Gaillard
Adding machine A. R. Jennings
Aerial vessels, Sustaining device for
..... I. Gruber
Agricultural implement W. J. Orr
Agricultural machine T. J. Thorp
Air brake locking device V. C. Orange et al
Air compressor L. B. Cousins
Air cooling and humidifying apparatus
..... J. D. Minto et al
Alarm lock O. Miller et al
Alloys, Heat treatments of steel
..... J. Churchward
Alternator, Self exciting L. J. Le Pontoux
Anchor for air ships D. Thomas
Anesthetics, Apparatus for administering
..... F. U. Brookling
Automobile and other vehicle A. C. Heath
Automobile horn I. E. Stump et al
Automobile shock reducer W. Grothe
Automobile stop, Automatic C. O. Lambert
Automobiles, Chain driving gear case for
..... F. Charion
Awning J. C. Knabeschuh
Awning T. H. Rees
Axes, Pivoted nail claw for W. L. Marble
Axle box dust guard R. Purdie
Bag lock L. B. Prahar
Bagasse furnace F. F. Willem
Baling press E. Rhodovi
Battery B. D. Downs
Battery plates, Making storage W. L. Stuyve
Bearing for electrical and other instruments, Jeweled
..... J. Wennstrom
Bedclothes clamp A. Grandjean
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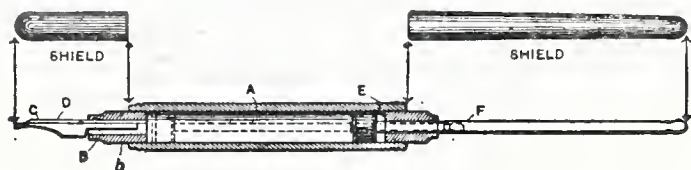
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SETTING TYPE BY TELEGRAPH.

By L. RAMAKERS.

TELEGRAPHY is one of the few branches of human activity in which the tendency to substitute machinery for human skill has not yet made much progress: but there are indications that the era of machine telegraphy has arrived. In the United States alone over four hundred printing telegraph patents have been issued since the invention of the electric telegraph. These embrace about 150 distinct printing telegraph instruments or systems: and yet, with the exception of the stock tickers and the Hughes printing telegraph, it is only within recent years that two or three really successful machines have emerged. In hardly any other field of human endeavor has so much labor resulted in so little achievement. There are many reasons for this lack of success: but they are all based on the complexity of the conditions to be fulfilled. With one or

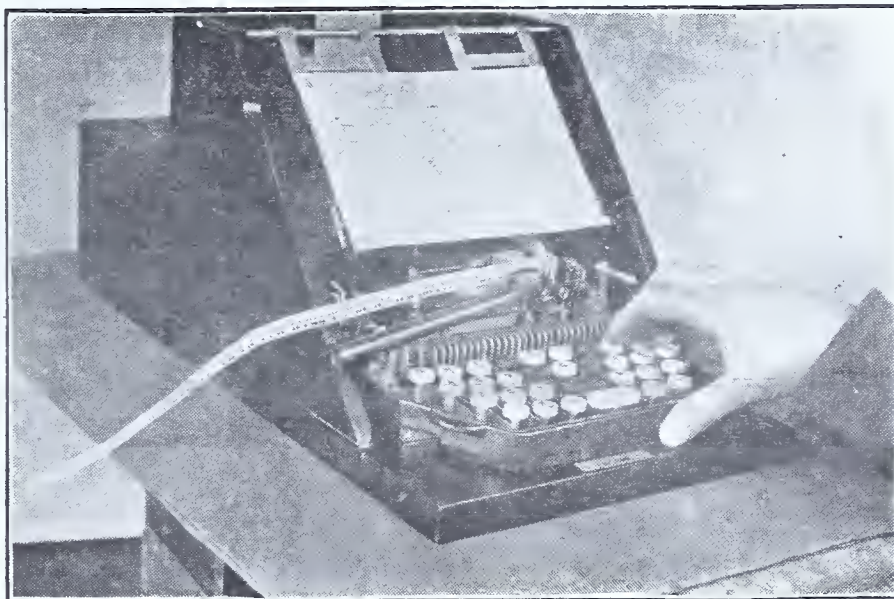


FIG. 1.—MURRAY KEYBOARD PERFORATOR READY FOR USE.

on the ends of type-bars, as in most typewriters, or as loose type in a type-setting machine: but in all cases the problem is to bring a particular type to a particular point in the shortest possible time, and in the case of the printing telegraph, to do this at a distance, over a single telegraph wire.

During the past few years several successful printing telegraph systems have been placed on the market, and among the most noteworthy of these may be mentioned the Baudot, Rowland, Buckingham and the Murray. Machines of the latter type are now being subjected to tests by the British Postoffice. A prolonged trial of their merits has been made in the German Telegraph Service, and a number of the instruments have been ordered by the Russian Government.

As originally designed, the Murray Telegraph Printing System was not

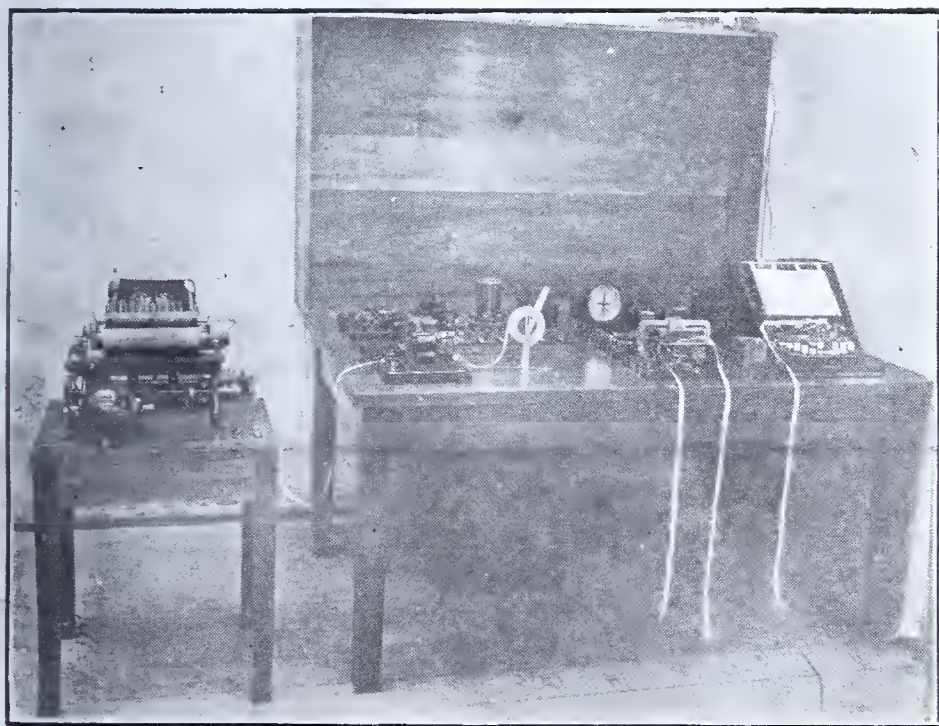


FIG. 2.—GENERAL VIEW OF A SET OF MURRAY APPARATUS.

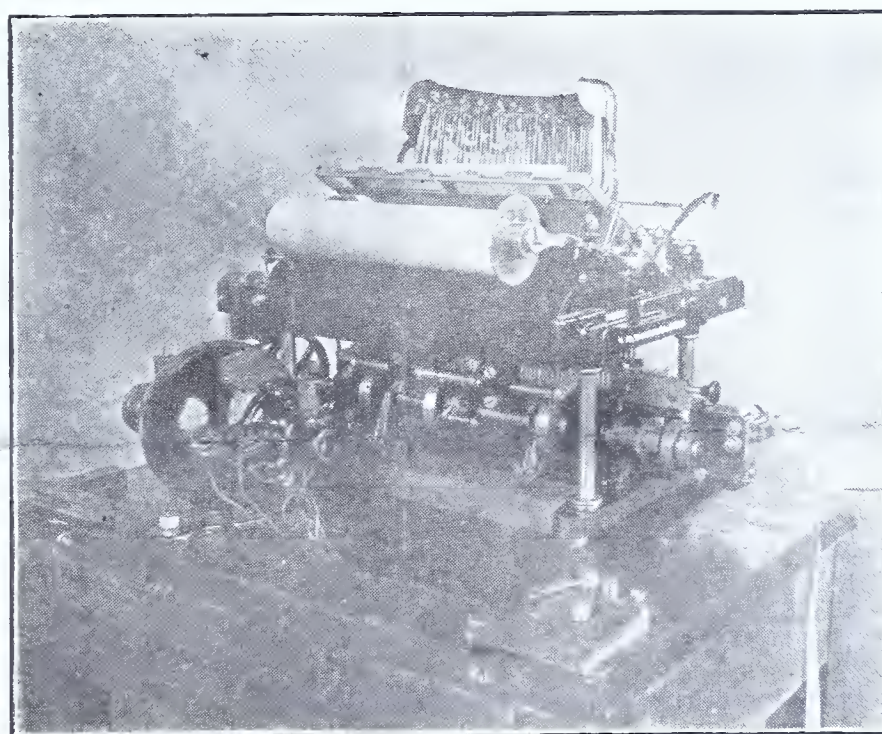


FIG. 3.—MURRAY PRINTER COMPLETE WITH TYPEWRITER.

two exceptions, telegraph engineers, realizing the difficulties of the subject, have left it alone, and inventors of printing telegraphs have, in most cases, been outsiders. In fact, all of the mechanical problems connected

with the handling of type (including typewriters, typesetting, type-casting, and similar machines) have proved very refractory, and the best solutions have often come through outsiders, who have stepped in where experts

feared to tread. The complexities culminate in the printing telegraph, because in that case the problem is to set type at a distance. The type may be fixed on the circumference of a wheel, or may exist as separate type

intended for sending messages between distant points, but for operating linotype machines automatically; that is to say, a perforated tape which has been produced by a typewriter keyboard was utilized to actuate the

mechanism of the typesetting machine. In developing his ideas with the particular purpose in view, Mr. Murray ascertained that his invention was equally applicable for telegraphic transmission, and further, that operating a linotype at a distance was easy of accomplishment. It seems obvious that it is just as easy to operate a linotype keyboard automatically by telegraph as to operate the keys of the typewriter used in the Murray Printing Telegraph System. In this system, the transmitter comprises a collector, a motor, and a vibrator, while the receiver includes a distributor, recorder and translator. The first step in sending a message is to prepare a tape by means of a perforator, a device having a keyboard like a typewriter, but instead of printing Roman letters it translates these into a telegraphic code and punches them in a tape of paper. Figure 1 is a general view of this translating instrument, with the cover on and the lid opened like a piano, ready for operation. At the back there is a box holding a condenser to suppress the spark at the punching contact. On top of this box rests the ordinary Wheatstone tape-feed wheel. In front is the actual perforator, which includes a punch block with five punches and an electromagnet, the armature of which punches on its front stroke and feeds the tape forward one letter space on its back stroke. This magnet does the whole of the work, and there are only two electrical contacts, one a punching contact and the other a letter-counting contact to indicate the length of the lines for the page-printing. There is also a typewriter keyboard with thirty-three keys, the touch and depression of which have been made very light and short to increase the speed of operation. A simple selecting or translating mechanism completes the machine, which is quite as portable as an ordinary typewriter.

The correction of errors on the tape, for which the Murray system is noted, is accomplished easily and quickly. In all other telegraph printingschemes it is necessary, in order to change a single letter, to rub out an entire line. In this apparatus when a correction is to be made the operator strikes the key of the back-spacing lever, the letter-shift key, and then the letter required. This eliminates the great objection of operators to machine printing telegraphs, where the danger of making a mistake distracts the attention and causes them to work much more slowly.

The next is automatic transmission. After a number of messages have been punched on the tape, it is put into the automatic transmitter. In the Murray single-line transmitter (see Fig. 5) the electric impulse is not broken up into a succession of dots, as in the Morse system, by the separate holes, but a continuous telegraphic signal is sent over the line which is equal in length to all the perforations representing a letter. Where those parts of the tape intervene that are not punched, the current is reversed and is so maintained until fresh perforations appear. As there is only one row of message-

holes in the tape, the transmitter is a considerable departure from former models, in which the signals depend on the relative positions of message-holes arranged in two rows. In the new transmitter the signals depend on the relative positions of perforated and non perforated units of tape.

The impulses from the sending station are received by the distributor at the receiving station which consists of two relays, a vibrating reed, and a recorder. In practice the main-line signals pass through an ordinary polarized relay to earth, this relay operating two local relays; but for the sake of clearness the main line signals are shown passing direct through the two local relays to earth. It is by

unit by means of the escapement and star-wheel on the motor-driven spindle. When there are no signals passing in the main line, a special device cuts out the spacing magnet by opening the switch, and so stops the tape; but as long as a message is passing, the vibratory action of the spacing magnet is continuous, and the tape is fed forward at a fixed speed.

Isochronism is required only between the sending and receiving stations, synchronism being essential between the different instruments of the receiver. Isochronism means the identical speed of two bodies at a distance from one another, and synchronism means the identical speed and phase of two bodies at a dis-

ments, and this is easily and perfectly secured.

The transmitted message having been punched on the receiving tape by the devices described, the tape may be used for any one of a number of purposes, namely, for transmission over other circuits; or it may be run through a printer and the signals translated into printed letters on a page, or it may be used in conjunction with a linotype machine and the message set up and cast in type ready for press.

If the tape is not required for retransmission, then the tape signals have to be translated into Roman letters and printed. The tape is fed along letter by letter (five units at a time) by a star-wheel, carried on a shuttle which is kept reciprocating by means of a cam, each reciprocation rotating the star-wheel one letter space. The shuttle carries a die-plate coinciding with the circumference of the star-wheel, and having five holes corresponding with the message-holes in the tape. Five rods fixed in the ends of five slotted combs, are free to enter the five holes in the die-plate if they are not obstructed by the paper tape which passes between the rods and the die-plate. On its inward stroke the shuttle with its die-plate presses the tape, with a letter group of perforations, against the ends of the five rods. Rods that are opposite holes in the tape pass through into the die-plate, and the positions of the corresponding combs are not altered. But in the case of non-perforated units of tape, the corresponding combs are thrust back about one sixteenth of an inch. By this means one particular group of slots in the combs, and only one out of fifty-six, is brought into alignment, so that a latch or cross-bar can drop into it. Although only four latches are shown, there are fifty-six of these small levers, one for each of the fifty-six permutations or groups of slots. The latches or cross-bars are supported by a universal bar just clear of the teeth of the combs. At the right moment this bar drops and leaves all the cross-bars resting on the combs; but only one out of the fifty-six is selected by the particular aligned group of slots corresponding to any particular group of holes in the tape.

The printer, (Figs. 3 and 4) is driven by a small motor consuming about 40 watts for a speed of 140 words per minute. This motor also supplies the power for automatically returning the typewriter carriage to the beginning of a new line. The speed of the printer is not less than 900 letters (150 words) per minute, and the automatic portion of the mechanism runs perfectly up to about 200 words a minute.

In this system, when a message arrives at the receiving station, the holes punched in the tape will operate special keys on a typewriter, pulling the typewriter carriage back when necessary, and working it as if by human hands. In the same manner that a linotype machine is worked, a press message sent off in the usual way may, by means of the Murray apparatus, be set up in type at the other end, and all over a single wire.

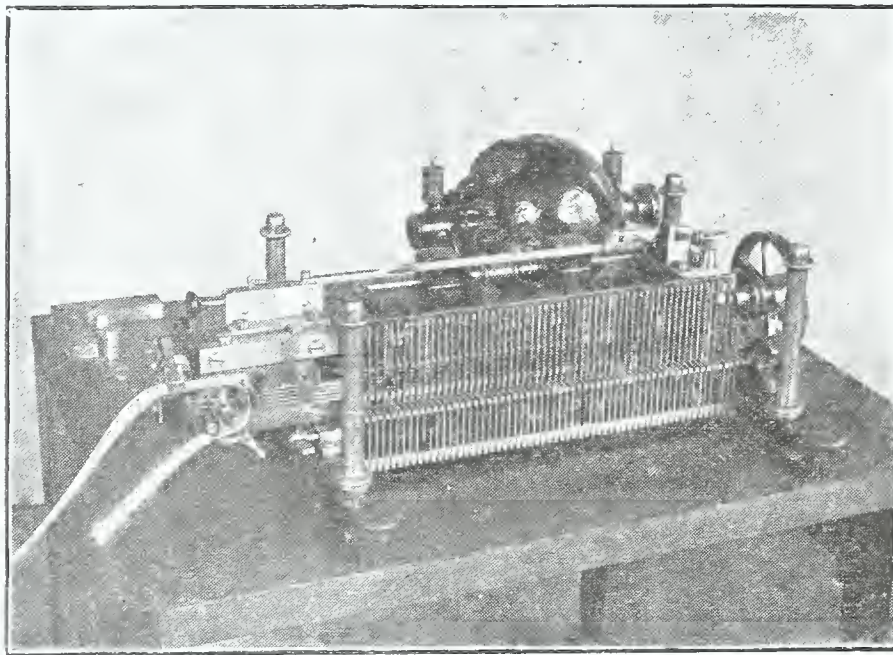


FIG. 4.—MURRAY PRINTER WITH TYPEWRITER REMOVED.

means of these two relays that the rest of the distributing mechanism is controlled. The recorder, which punches the message-holes in the receiving tape, consists of a punching magnet and a spacing magnet. The punching magnet operates a punching lever and a punch which reproduces

tance from each other. It is a physical impossibility, Mr. Murray has pointed out, to secure synchronism between a transmitter and a receiver in telegraph systems, as the current impulses always lag at the receiving end: for this reason there is really no such thing as synchronous systems of

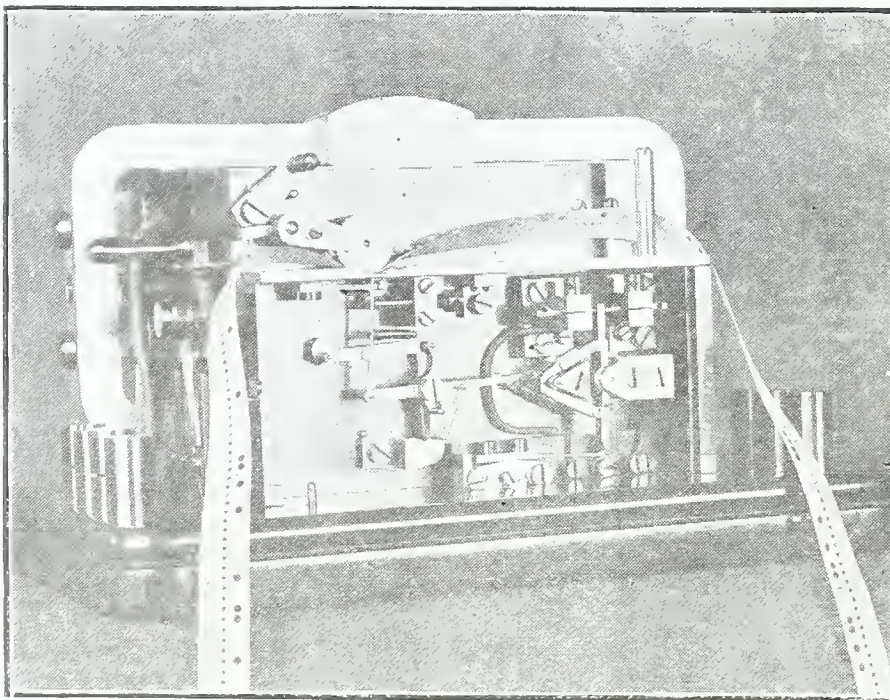


FIG. 5.—SINGLE LINE TRANSMITTER.

the motions of the rod in the transmitter, and thereby reproduces the perforations in the tape. On short circuit the punch and the rod may be seen to be working precisely in step with each other. The spacing magnet feeds the tape forward unit by

telegraphy, and the nearest they ever get to it is an approximation of synchronism. The more exact the conditions of synchronism are, the more inefficient the system employing it. The Murray system utilizes isochronism alone between the distant instru-

NEW TYPE OF TRACK-BRAKE.

THE accompanying illustration shows a new type of track brake in use on the street cars in Oldham, England. The slipper block, as may be seen, is forced on to the rail by means of two cylindrical-shaped adjustable springs, which are held in compression, and act directly on the block. For ordinary service this block can be raised and lowered by a small hand wheel on the car platform, and for emergency stops the driver can apply the full force of the brake by simply pressing a lever down with his foot. He has therefore free use of his hands to work the controller and hand-brake handles, as the brake does not require any further attention once it is applied, but remains set until the driver releases it.

During tests made with this brake on a single-truck car, weighing about 7 tons, on a gradient of 1 in 11, travelling at the rate of 10 miles per hour, the car was stopped by the track-brake alone in 13 yards. It also serves to



prevent a car which is ascending an incline from running backwards when suddenly deprived of the current, and keeps the car at rest until the driver releases it.

The new brake is capable of being brought into action either slowly by means of the hand wheel or imme-

diately by means of the foot lever as required. There is no pull or strain at any time on the car platform. The brake has few working parts, is very readily fitted together, and does not interfere with the examination and repair of the car equipment. It is also an entirely independent brake,

as it does not rely on any other part of the car mechanism to aid it in its action.

The illustration shows the brake mounted on a Brill truck. The track brake is seen from below as it is fitted on the bottom of the car; the connecting rod, the levers, the block and the springs are easily distinguished.

New Motor Wheel.

An important step in the evolution of motor vehicles may be marked by a new wheel, intended to replace the pneumatic tire for automobiles and bicycles. This is the invention of a Saxon engineer, and according to our Consul at Chemnitz, the fundamental principle is the construction of a wheel which is not rigid, but possesses in itself a sufficient degree of elasticity to replace effectively the resilience of the customary pneumatic tire. The wheel is made entirely of the finest quality of steel—fellys, spokes and hub. The spokes are not simply radii of a circle, as in the ordinary wheel construction. They are essentially diameters of the wheel. Each diameter or double spoke is a round wire or rod, flattened, however, in the middle, where it is firmly attached to the hub, about which it is bent so as to form an angle of about 90 degrees. The entire system of spokes consists therefore, of a series of L's arranged about the hub. The latter is formed of two close-fitting parts moving slightly one against the other.

The practical result of this arrangement is that when carrying a load, the spoke for the moment extending to the point of contact between the wheel and the roadbed, is slightly shortened, and its right angled complement is lengthened to the same extent. The form of the wheel becomes faintly elliptical, all of the spokes and fellys sharing to a more or less limited degree, in the deflection from the normal position. The compound spoke assumes its original position as the load bears upon its neighbor, and as the wheel moves forward, there is a constant change in the location of the ellipse. The result of this continual spring-like alteration in the form of

the wheel is an avoidance of jar and vibration to the load,—i. e., the passengers—equivalent to that produced by the use of pneumatic tires. This effect is heightened by the addition of solid rubber tires, covering an air cushion in the channeled concave surface of the wheel's rim.

The whole construction, it is said, is exceedingly simple. The surface exposed to friction in the slight internal movements of the composite hub is easily lubricated and well protected from dust, while the actual friction is so small as to scarcely enter into consideration. It is this simplicity and this freedom from the necessity of frequent attention and the ever present danger of interruption and delay, which will probably appeal to the users of bicycles and automobiles. The annoyance of punctured tires and the necessity of providing for such emergencies has always been a serious drawback to the otherwise great convenience of pneumatic tires. Their exceedingly short term of life is another consideration.

The most serious question to be encountered is durability by the new device. Experiments have shown that the spring like action of the wheel is uniformly secured when it is employed for either a bicycle or for a heavy vehicle. It is a matter of common scientific knowledge that steel, no matter how finely tempered, like all other metals, undergoes a slow but steady deterioration in its properties, a gradual lessening in its cohesion and tenacity, when exposed to continuous bending or similar alterations in form. Familiar examples are car axles, suspension-bridge cables, band saws, etc. In this case, the deflections from the normal position when at rest are comparatively insignificant

compared with those of an ordinary carriage spring. Still in all probability, such a wheel must eventually meet the fate of the deacon's "one-hoss shay." During its lifetime, however, it seems to offer conspicuous advantages over existing styles in point of reliability and limited amount of attention required. Other favorable features are cheapness, lightness, and simplicity of construction, ease in cleaning and the reduction to a minimum of friction and consequently wear and resultant repairs.

Long Distance Control of Ships.

Endeavors have been made quite recently to transmit electrical energy for power purposes without the intermediary of any conducting wire. Instead, however, of transmitting large amounts of power to be used at the receiving station for the performance of a given operation, it will be found advantageous in many cases simply to have the wireless outfit operate a relay actuating a local circuit at the receiving end, by means of which the desired work may be performed. The starting or stopping of motors is thus effected by an apparatus designed by Professor Branly, one of the pioneers in wireless telegraphy.

Another device for the same purpose is due to a Spanish engineer, and is intended for automatically actuating the screw and rudder of a boat, which may thus be steered from the shore in exactly the same way as by a pilot on board. The apparatus may also be used for steering a balloon or airship from the land, and for similar purposes. The invention comprises two parts—an ordinary wireless telegraph outfit, and the apparatus actuated by the electric waves,

the latter representing the invention itself.

Tests recently made in Spain are described in the Technical World Magazine. A boat contained the receiving station, the aerial of which collected the electrical waves, transmitting them to a small tube filled with filings. These filings, becoming conductive, allowed the current to pass, causing an electro-magnet to oscillate. A small oscillation on board the boat thus corresponded to each spark given off from the land station.

The new device, which is called the telekino, consists of three electro-magnets in addition to the mechanical pieces serving to actuate the screw and the rudder. While the central electro magnet reproduces the signals, the two remaining ones serve to effect the various operations. The inventor is bestowing special care on reinforcing and increasing the oscillations occurring in wireless telegraph outfits, storing this motive force in special accumulators provided with two branches that lead to the screw and rudder respectively. The whole operation thus consists in opening or closing the two circuits. The oscillations produced in the central electro-magnet act on a small escapement wheel, advancing by one tooth at each oscillation so as to open or to close the circuits. By an ingenious mechanism, the various parts of each electro magnet, after accomplishing the motion controlled by the sending station, return to their initial position so as to be ready to work anew.

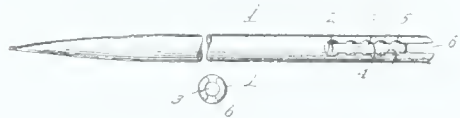
In the trials, the boat was made to perform a number of operations in various directions with surprising accuracy. It is believed that the telekino can be applied to the prevention of shipwrecks as well as to the defense of marine places without any risk of human life.

CLEVER NEW PATENTS.

Surgical Needle.—Abrading Implement.—Hay Stacker.—Truss.—Ice Creeper.—Fence Post.

Surgical Needle.

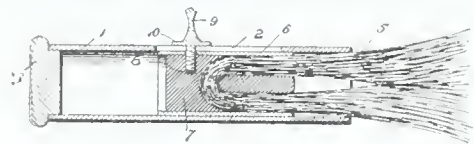
Dr. T. C. Edwards, of Salinas, California, has secured a patent on an improvement in surgical needles, the object of which is to provide a needle in which a single strand of a suture may be positively be d assembled with the needle when being passed through tissue, thereby reducing the size of the aperture and facilitating the operation of sewing. At the same time, the needle is thus simplified, and many of the defects present in the old style needle are obviated. It will be noted by reference to the accompanying illustration that the needle,



designated 1, is provided with an eye 2 disposed some distance in advance of the rear end of the needle. Connecting the eye with the head of the needle is a groove 3, which extends nearly through the needle, forming thereby spring jaws for frictionally engaging the suture, and also permitting said suture to occupy a position directly in line with the longitudinal axis of the needle. In other words, the suture is housed within the groove, so that the orifice made in the tissue will be no larger than the cross sectional area of the needle. In order to insure the holding of the suture, the walls of the groove or the jaws are provided with a series of transverse notches or depressions 5, thus roughening the surface and insuring the holding qualities.

Abrading Implement.

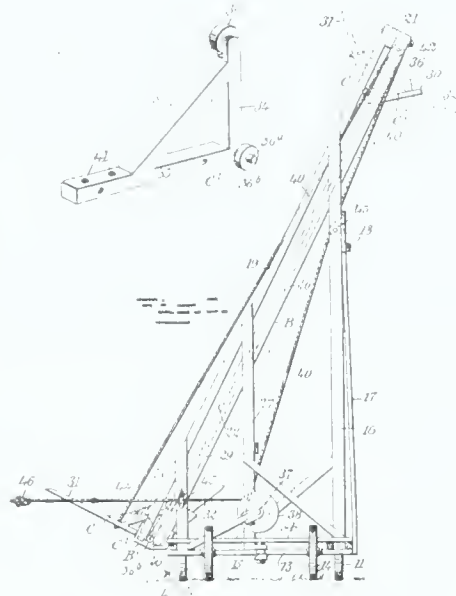
Messrs. George S. Edwards and William W. Williams, of Cortland, N. Y., have together secured a patent on an abrading implement, which is in the form of a brush. This brush comprises a bunch of wire bristles 5 doubled upon themselves, and secured within a metallic sleeve 6 by a slug of



solder or lead 7. The sleeve is slidably mounted in a handle 1, the sliding movement thereof being secured and limited by a projecting thumb piece 9 engaged in the sleeve and slug and operating in a slot 2 in the handle. The device can be used for a large number of purposes. For instance, in cutting old paint from wood work and cleaning rust from metallic articles. The free ends of the bristles are extended only a short distance beyond the handle, making them practically rigid, so that they will cut rapidly and effectively. Where a less degree of abrasiveness is required, the brush is projected farther from the handle. Thus different effects can be secured and the wear provided for.

Hay Stacker.

A new hay stacker has been patented by David D. Ogilvie, of Lee, Nebraska. The purpose of the invention is to provide a very simple, durable, economic and effective form of hay stacker, adapted especially for stacking hay from buck rakes, and to so construct the machine that the fork conveyor can be speedily and conveniently raised and lowered, and wherein, when said conveyor reaches the highest point in its ascent, it will automatically discharge its load in such manner as to deliver the hay to the middle of the stack rather than at one side, as most stackers do. An inclined track or guide 20 is supported by a novel frame that is mounted on wheels. In the lower portion of this frame is journaled a drum 38. A reciprocating conveyor C operates on the guide or track, and a cable, fastened to the outer portion thereof, passes from a pulley at the upper end of the track, and is wrapped upon the drum. The upper portion of the track is rearwardly curved, as shown at C', and wheels mounted on the conveyor

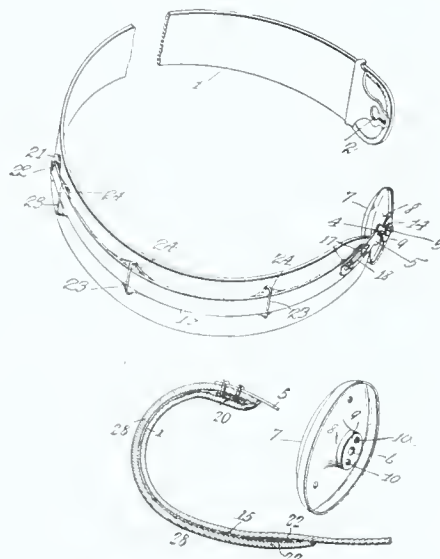


or elevator run upon the track. A draft cable 44 is also wrapped upon the drum 38, and a horse is arranged to be hitched to this draft cable. With this arrangement, after a load has been placed upon the elevator C, the drum 38 is revolved, thereby raising said elevator, and as it reaches the upper end of the guide or track, the rollers run upon the rearwardly inclined portion C', thus causing the elevator to tilt and deliver its load upon the stack.

Truss.

Mr. George L. Gerard, of New Haven, Conn., has secured a patent on a truss, the particular advantage for which is its ease of adjustment, and the positive way in which it will remain in place. A belt 1 is employed that is flexible throughout its entire length, and has a spring 15 loosely mounted upon its exterior. The spring is provided at one end with an antifriction device 21, while a pad 7 is adjustably connected by a link 5 with the other end, this adjustment being secured by a slot 18, formed in the link and screws 17, which are threaded into the spring 15, and pass through the slot. The pad is located at one end of the belt, and the other end is provided with an adjustable eye 2 to engage with either one of a pair of headed studs 3 and 4 located upon the pad

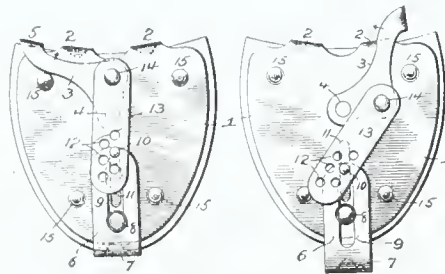
carrier link 5. The particular type of pad carrier is, however, not important, and may be modified to some extent. Thus a different form is shown



in the sectional view. The link 5 is still employed, but it will be observed that the pad carrying end of the belt is combined with a supplemental ply 25, between which and the belt proper the pressure spring is housed, and is free to move therein. The pad carrying link 5 is disposed exteriorly of the belt proper.

Ice Creeper.

An ice creeper, the invention of Mr. Olof A. Norlund, of Williamport, Pa. constitutes the subject matter of a recent patent. Mr. Norlund's aim has been to provide a creeper with improved means for securing the same to the heel of a boot or shoe, the securing means being so situated and constructed that it will not accidentally open. A plate 1 is employed having a fixed prong 2 at its forward edge, and a movable bar 6 is mounted on



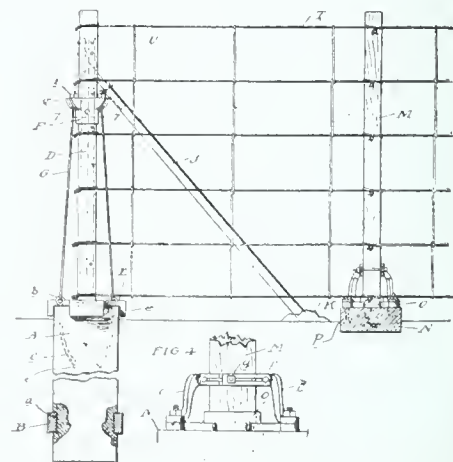
the plate and has a prong 7 at its rear end to engage the rear end of the heel. A lever 3, pivoted to the plate, is connected by a link 4 with the movable

bar. This lever projects from its connection with the plate, forwardly beyond the front edge thereof, and has an upward projection on its free end. The upward projection is adapted to lie against the front wall of the heel. Consequently the device is secured to the heel by forcing the lever sideways, in which case the prongs are firmly embedded in the heel and there is little danger of accidental detachment. The plate 1 is provided with suitable spurs.

By arranging the lever 3 to project its free end against the forward or front edge of the heel, rather than against the sides or rear of the heel, all liability of accidental movement of the lever, by striking any object, is obviated, as the end of the lever is protected from striking. Should it engage an object such contact would merely force the lever end against the heel, and not unlock the same.

Fence-Post.

Mr. Joseph D. Paldi, of Yale, Mich., has secured a patent on a novel form of fence structure: more particularly the posts. The posts are



placed upon bases formed of artificial stone or concrete. The corner posts have a base A embedded in the ground with bars B fastened to it. A plurality of anchors C are embedded in the upper end of the base, and have stays G attached to them. These stays are fastened at their upper ends to a head F secured to the post, the lower end of the post being secured to a metal cap E mounted on the upper end of the base. The intermediate posts M are supported on bases N of concrete, and have their lower ends fitted in socket pieces O secured to the tops of the bases. The socket pieces are attached to the bases by studs which also constitute braces secured to the lower portions of the posts, as illustrated in the detail view.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

NATIONAL STARCH CO. v. KOSTER

(Circuit Court, S. D. New York, June 6, 1906. 146 F. R. p. 259.)

1. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—SIMILARITY OF DRESS.

Where articles of merchandise of the same kind are made by different manufacturers in the same city, the name of which appears on the packages, one having a long established reputation, a later manufacturer is required to exercise care to differentiate his packages, so that purchasers will not confuse the two products.

2. SAME—RIGHT TO INJUNCTION—FRAUDULENT USE OF PACKAGES BY COMPLAINANT.

A motion for preliminary injunction to restrain unfair competition by the imitation of complainant's packages will not be granted, although such imitation is shown, where there is evidence which, though disputed, tends to show that complainant has used its packages for an article different from that for which they were designed, of inferior quality, and not made at the place thereon stated.

G. & C. MERRIAM CO. v. UNITED DICTIONARY CO.

(Circuit Court of Appeals, Seventh Circuit, April 10, 1906. 146 F. R. p. 354.)

1. COPYRIGHTS—BOOKS PUBLISHED ABROAD—STATUTES.

Rev. St. § 4956 [U. S. Comp. St. 1901, p. 3497], provides that during the existence of a copyright the importation into the United States of any book so copyrighted or any edition thereof, or any plates of the same not made from type set, etc., within the limits of the United States, shall be prohibited, except in certain cases, etc. Held, that such provision was not intended to do more than prohibit the producing abroad of copyrighted books designed for sale in the United States, and had no application to the reproduction in the United States, of a book copyrighted in Great Britain which contained no notice of copyright in the United States of a similar book intended for publication in the United States.

2. SAME—WAIVER OF COPYRIGHT.

Rev. St. § 4956 [U. S. Comp. St. 1901, p. 3497], provides that no person shall be entitled to a copyright, unless, on or before the day of publication in the United States or any foreign country, he shall deliver to the librarian of Congress a printed copy of the title of the book and two copies of the book not later than the day of publication in the United States or any foreign country, and section 4962 provides for the insertion of the copyright notice in the several copies of every edition published, etc. Plaintiff simultaneously published and copyrighted a dictionary in Great Britain and the United States, neither being intended to compete with the other: the English book containing no reference to the American copyright, but fully complying with the copyright laws of Great Britain, as did also the American book, with the copyright laws of the United States. Held, that complainant's failure to insert a notice of the American copyright in the English work did not constitute a waiver of its American copyright.

3. SAME—COPYRIGHT NOTICE—INSERTION—DIFFERENT BOOKS.

Where the title in the first 3 and last 34 pages of the copyrighted English edition of a dictionary was different from the copyrighted domestic edition, the publisher of the English edition was prohibited by Rev. St. § 4963 [U. S. Comp. St. 1901, p. 3412] from inserting therein a notice of the domestic copyright.

4. SAME—INFRINGEMENT—PUBLICATION—USE OF PART.

An infringement of a copyright may result in the wrongful use of a part as well as the whole of a copyrighted publication.

5. SAME.

Where complainant simultaneously published and copyrighted a dictionary in England and the United States, the English book being somewhat different from the domestic, the publication in the United States of a photographic reprint of the English edition imported for that purpose constituted an infringement of complainant's copyright.

AMERICAN TOBACCO CO. v. WERCKMEISTER.

(Circuit Court of Appeals, Second Circuit, April 4, 1906. 146 F. R. p. 375.)

1. COPYRIGHT—PAINTING—COPYRIGHT BY "ASSIGN" OF OWNER OR AUTHOR.

Under Rev. St. § 4952, as amended by Act March 3, 1891, c. 565, 26 Stat. 1106 [U. S. Comp. St. 1901, p. 3406], which authorizes the proprietor of any painting, etc., "or assigns of any such person," to obtain a copyright thereon, the owner of a painting may transfer to another by assignment the right of copyright, although the assignee does not become the owner of the painting.

2. SAME—NOTICE OF COPYRIGHT.

Act June 18, 1874, 18 Stat. 78 [U. S. Comp. St. 1901, p. 3411], relating to notice of copyright, does not require such notice to be placed upon the original of a copyrighted painting or upon its mount, but only upon the copies thereof.

3. SAME—ACTION FOR FORFEITURE OF COPIES.

An action by the owner of the copyright of a painting, brought under Rev. St. § 4965 [U. S. Comp. St. 1901, p. 3414], for a forfeiture of the plates and copies of an infringing publication, is not the statutory action of replevin, and the right to maintain it does not depend on plaintiff's ownership or previous right of possession.

AMERICAN LITHOGRAPHIC CO. v. WERCKMEISTER.

(Circuit Court of Appeals, Second Circuit, April 4, 1906. On Motion to Amend Mandate April 24, 1906. 146 F. R. p. 377.)

COPYRIGHT—PENALTY FOR INFRINGEMENT—PAINTING.

Under Rev. St. § 4965 [U. S. Comp. St. 1901, p. 3414], providing the penalties recoverable for infringement of a copyright, and that the infringer "in case of a painting * * * shall forfeit ten dollars for every copy of the same in his possession or by him sold or exposed for sale." It is not necessary that the infringing copies of a painting shall be found in defendant's possession to authorize the recovery of the penalty named, as in case of a book or photograph, but it is sufficient if they were either so found or have been sold or offered for sale by defendant.

PHOENIX CAP CO. v. REISS et al.

(Circuit Court, S. D. New York, December 1, 1905. 146 F. R. p. 387.)

PATENTS—INFRINGEMENT—HERMETICALLY SEALED JARS.

The Weissenthanner patent, No. 483,033 for a hermetically sealed jar, if conceded patentable novelty, is for a combination of elements all of which were old, and its claims must be strictly construed, and limited to the precise combination shown. As so construed held not infringed.

WEST DISINFECTING CO. et al. v. FRANK et al.

(Circuit Court, S. D. New York, June 19, 1906. 146 F. R. p. 388.)

1. PATENTS—DESIGNS.

Design patents are granted for appearance, and not with reference to mechanical usefulness.

2. SAME—INFRINGEMENT—CASE FOR DISINFECTANT.

The Taussig design patent, No. 33,633, for a design for a casing for disinfecting apparatus is valid, the peculiar contour of the patent rendering the device attractive to users. Also held infringed.

UNIVERSAL BRUSH CO. v. SONN et al.

(Circuit Court, N. D. New York, July 14, 1906. 146 F. R. p. 517.)

1. PATENTS—INFRINGEMENT—METHOD OF MAKING BRUSHES.

The Morrison patent, No. 717,014, claim 1, for a method of making brushes, which consists in depositing a mass of heated plastic composition, which becomes hard when cooled, within a chambered brush-frame having a contracted aperture, and forcing one end of the groups of bristles into the composition when in the plastic state, is a fundamental one, which made an important and useful advance on the prior art, and is entitled to a broad construction and to the benefit of the doctrine of equivalents. The chamber having a "contracted aperture" is merely one of the means used in carrying the method into effect, and the claim is infringed by the method of the Sonn patent, No. 791,510, which is the same in principle, and, although the chamber used has not such contracted aperture, it has a raised portion in the center, which is its substantial equivalent as such means.

2. SAME—EQUIVALENTS.

A substantial equivalent of a patented device or means which performs the same function does not avoid infringement because it may perform an additional function.

VICTOR TALKING MACHINE CO. et al. v. TALK-O-PHONE CO.

SAME v. LEEDS & CATLIN CO.

(Circuit Court, S. D. New York, April 26, 1906. 146 F. R. p. 534.)

1. PATENTS—EXPIRATION OF FOREIGN PATENT—IDENTITY OF INVENTION.

A prior patent in a foreign country for a minor part of a broad or basic invention is not for the same invention as a subsequent United States patent covering both the minor parts and the broad main invention, within the meaning of Rev. St. § 4887 [U. S. Comp. St. 1901, p. 3382], and such foreign patenting of a part does not so affect the whole that the expiration of the foreign patent terminates the whole of the American patent including the broad claims.

2. SAME—TERM OF FOREIGN PATENT.

The provision of Rev. St. § 4887 [U. S. Comp. St. 1901, p. 3382], that a United States patent shall expire at the same time as a prior foreign patent for the same invention, has reference to the legal term of the foreign patent as appears on its face at the time of the issuance of the United States patent, and the latter is not further limited by the subsequent lapse or forfeiture of any portion of such legal term of the foreign patent by the failure to comply with a condition subsequent, such as the payment of additional fees at stated intervals.

3. SAME—INFRINGEMENT—GRAMOPHONE.

The Berliner patent, No. 434,543, for improvements in talking machines, claims 5 and 35, held valid as against the claim that they expired with certain foreign patents, and a preliminary injunction granted restraining their infringement on prior adjudication of their validity.

EDISON GENERAL ELECTRIC CO. v. CROUSE-HINDS ELECTRIC CO.

(Circuit Court, N. D. New York, July 20, 1906. 146 F. R. p. 539.)

PATENTS—INFRINGEMENT—ELECTRIC LAMP SOCKETS.

The Metzger patent, No. 489,682, for an electric lamp socket, claims 5 and 7, are valid, and although not entitled to a broad construction, as for a pioneer invention, are, on the other hand, when read in connection with the specification, not so limited as to deprive them of all benefit of the doctrine of equivalents. As so construed, held infringed by a structure which contains all of the elements of the claims in substantially the same combination and arrangement, and each performing the same function, although some of them differ in form. Claim 6 held void for lack of invention.

GENERAL ELECTRIC CO. v. BULLOCK ELECTRIC MFG. CO. et al.

(Circuit Court, S. D. Ohio, W. D. Feb. 19, 1906. 146 F. R. p. 549.)

PATENTS—INFRINGEMENT—ARMATURE CORE.

The Reist patent, No. 508,637, for an armature core was not anticipated and discloses invention. Also held infringed.

GENERAL ELECTRIC CO. v. BULLOCK ELECTRIC MFG. CO. et al.

(Circuit Court, S. D. Ohio, W. D. 146 F. R. p. 551.)

PATENTS—INVENTION—ARMATURE.

The Reist patent, No. 513,107, for securing field magnet poles, is void for lack of patentable invention.

GENERAL ELECTRIC CO. v. BULLOCK ELECTRIC MFG. CO. et al.

(Circuit Court, S. D. Ohio, W. D. 146 F. R. p. 552.)

PATENTS—INVENTION—ELECTRIC MOTOR.

The Parcell patent, No. 463,704, for an electric motor and dynamo, is void for lack of patentable invention: the manner of fastening the yoke and the laminated core, which is its essential feature, having been adapted from prior devices without change of form or functions of the parts.

BAKER v. F. A. DUNCOMBE MFC. CO.

(Circuit Court of Appeals, Eighth Circuit, May 9, 1906. 146 F. R. p. 744.)

1. EVIDENCE—JUDICIAL NOTICE—PATENTS INVENTION—MATTERS GENERALLY KNOWN.

On the question of invention, in a suit for infringement of a patent, the court will take judicial cognizance of facts of general knowledge or devices in common use which

may be similar to or identical in principle with that of the patent.

2. SAME—INVENTION.

Applying an old process to a new use is not invention.

3. SAME—PROCESS OF TREATING COFFEE.

The Baker patents, No. 726,812 and No. 736,346, each for a process of treating coffee and the product of such process, which consists of cutting or crushing the roasted coffee bean and winnowing the dust, chaff and disengaged silver skin of the bean from the granulated product by means of an apparatus designed for the purpose and consisting of a hopper, crushing or cutting rolls, and a screen or sieve through and over which a blast of air is forced, are void for lack of invention, in view of the old and familiar use of the same process in the cleaning of grain, so long known and practiced that a court may take judicial cognizance of it.

4. SAME—PATENTS—INVENTION—IMPROVED PRODUCT—PATENTABILITY.

Granulated coffee is not patentable as an article of manufacture merely because the process used may produce granules which are more uniform and attractive in appearance than those otherwise produced.

CONROY et al. v. PENN ELECTRICAL & MFG. CO.

(Circuit Court of Appeals, Third Circuit, September 5, 1906. 146 F. R. p. 749.)

PATENTS—INFRINGEMENT—MIRRORS.

The Wright & Curry patent No. 631,033 for a mirror is not so limited by the prior art as to require it to be given a narrow construction and is entitled to a fair range of equivalents. Also, held infringed.

AMERICAN SEWAGE DISPOSAL CO. OF BOSTON v. CITY OF PAWTUCKET.

(Circuit Court of Appeals, First Circuit, August 15, 1906. 146 F. R. p. 753.)

PATENTS—INFRINGEMENT—SEWAGE APPARATUS.

The Glover patent No. 559,522 for a sewage apparatus reconsidered and held not to cover the principle of septic treatment of sewage, and not infringed by an apparatus using a septic tank.

SHEPHERD v. DEITSCH et al.

(Circuit Court of Appeals, second Circuit, April 2, 1906. 146 F. R. p. 756.)

PATENTS—INFRINGEMENT—BRUSH.

The Shepherd patent, No. 601,405, for a brush having a recticulated back, the openings in which extend between the bristles having the greatest diameter at the rear of the brush "and decreasing in diameter to the face thereof" is limited by the prior art and by the proceedings in the Patent Office to a construction in which the openings so decreased in diameter from the rear to the front of the brush back, and is not infringed by a brush in which the openings are of uniform diameter, except for a bevel at the back extending but a short distance.

GILLETTE v. SENDELBACH et al.

(Circuit Court of Appeals, Seventh Circuit, April 10, 1906. 146 F. R. p. 758.)

1. PATENTS—SUIT TO COMPEL ISSUANCE—SUFFICIENCY OF EVIDENCE.

Where the question which of two applicants for a patent for the same invention was the true inventor depends on questions of fact, the court, in an action brought under Rev. St. § 4915 [U. S. Comp. St. 1901, p. 3392], by the unsuccessful applicant to compel an issuance of the patent to him, must be very clearly satisfied that the decision of the Patent Office tribunals between the two was erroneous before it will be justified in reversing the same.

2. SAME—HUB CENTERS.

Complainant held, under the evidence, not entitled to the issuance to him as the true inventor of a patent for the subject matter of claims 1 and 2 of the Sendelbach patent No. 651,276, for a wooden center for a hub.

UNITED SHOE MACHINERY CO. v. GREENAN.

(Circuit Court of Appeals, First Circuit, July 6, 1906. 146 F. R. p. 757.)

PATENTS—INFRINGEMENT—SHOE SEWING MACHINES.

The French patent, No. 561,386, for a device for heating the looper of a wax-thread shoe sewing machine, makes an intermittent contact between the looper carrier and the heated block or plate an essential feature of the invention, by which it is distinguished from the prior art, and is not infringed by a device in which a constant contact is maintained between the two.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

Shelton M. Reese, Lyons, Ga.
Fence Post.—The fence post of this patent is provided with means for detachably engaging fence wires and woven wire fencing and crimping the same, whereby the wires or fencing are prevented from slipping on the fence post, and are held at the desired tension. The fence post embodies a base having a recess at its front end, an upper section or member rigid with the base and provided at the top with a projecting head having a recess, a clamping bar pivoted in the recess of the base and fitting in the recess of the head, and means for detachably securing the upper end of the clamping bar to the upper section or member. When the clamping bar is released, it is adapted to swing downwardly to permit the fence wires or the woven wire fencing to be removed, and by this construction, a fence may be quickly erected or taken down.

John F. Gegenheimer, Glassboro, N. J. Conveyer for Bottles, etc.—The machine of this patent is designed for carrying bottles and other articles of glassware from the point where they are blown and finished to the annealing oven or lehr, and it greatly reduces the number of boys usually required for handling such articles. It is adapted to automatically discharge its contents, and delivers flat bottles and similar objects to the receiving table with the same facility as round bottles. The apparatus comprises an endless conveyer provided at intervals with carriers having receiving portions arranged at different elevations, and provided with flanges to retain the glassware on them, and adapted to be tilted to cause the articles to roll over the flanges, and a table arranged to receive the contents of the conveyer and having a fixed portion and provided with an adjustable inclined portion or section, forming a continuation of the table in all of its adjustments, and adapted to be raised and lowered to position it properly with relation to the carriers of the endless conveyer.

William Schluter, New Hartford, Iowa. Two patents. Rein Support and Rotary Engine.—The rein support of this patent is designed particularly for use on corn harvesting and other agricultural machines, employing three horses, and it supports the lines crossing the space between the intermediate and right hand horse, to prevent the tall corn from interfering with the driving of the horses. It also enables the right hand horse, which walks between the rows of corn, to assist in controlling the machine in both pulling and backing. The rein support comprises an auxiliary tongue, a neck yoke having an arch secured at one side to the auxiliary tongue and having terminal extensions connected, respectively, with the main tongue and with the third horse of the team, a shield having its front end supported by the auxiliary tongue, a rear support mounted on the auxiliary tongue and connected with the shield and guiding means carried by the shield for the lines.

The second patent relates to improvements in engines which are adapted for use in connection with air, gas, steam or water, though preferably driven by an expansive fluid, such as steam. The object is to provide an exceedingly simple structure wherein steam pressure, rather than the momentum or speed of

the steam is employed, as in the case of the turbine, so that the expansive force of such fluid can be efficiently utilized. The rotary engine embodies a cylinder having communicating compartments, inwardly extending walls spaced apart and defining the inner portions of said compartments, a rotary piston journaled in each compartment, each piston having on one side an extension, and an abutment slidably mounted on each extension and having radially disposed shoulders at its ends, said abutments each co-acting alternately with the other piston between the ends of the abutment thereon, said spaced walls being respectively provided with inlet and outlet channels having branches that communicate with the compartments on opposite sides of the said inwardly extending walls.

Abram C. Persing, Willard, Mo. Fishing Bob or Float.—Mr. Persing has invented an ingenious device, by means of which a fish hook can be suspended at any depth desired from the surface of the water. The principal object is to provide a novel yet simple bob or float, which can be readily applied to a line at any place desired, without the necessity of threading such line at one end through the same, the device being as readily detachable, and yet, when in place, being entirely secure. This invention consists in a float body, a tubular holder passing there through and projecting beyond the opposite ends of said body, a shank passing through the holder and in engagement with the interior walls thereof, said shank being capable of longitudinal movement in the holder and having one end movable laterally of said holder, a terminal hook carried by the laterally movable end of the shank and having a free terminal normally engaging the adjacent end of the holder, said terminal being movable laterally away from the holder upon the corresponding movement of the shank to permit the passage of a line, a terminal hook carried by the other end of the shank and having a free terminal normally in engagement with the adjacent end of the holder, said terminal being movable away from the holder upon the longitudinal movement of the shank in one direction to permit the passage of a line.

John D. Bee, Jr., West Lynn, Mass. Seattle Door or Skylight Lifter.—The object of this invention is to provide an exceedingly simple device of a novel nature, which can be readily and cheaply manufactured, easily applied by a person of ordinary intelligence, is effective and durable, and is not liable to derangement. This invention consists in the combination with a door or window to be opened, of an elevating rod hinged thereto, a guide for said rod formed of sheet metal having its side margins doubled to form a base and outturned to provide guide walls, said guide walls being wider at their upper than their lower ends, and having opposing flanges spaced apart to form a slot, said elevating rod passing between the guide walls, an eye secured to the lower portion of the elevating rod and movable in the slot of the guide, a pulley fastened to the base at one side of the guide, and a cable passing about the pulley and secured to the eye.

Mr. John H. Kennebrew, Columbus, Miss., inventor; W. W. Garth, same place, assignee of one-half interest. Plow.—It is the aim of the present invention to improve hand or garden plows, and the principal object is to provide means, whereby the weight and body pressure of an operator may be transmitted to the front end of

the plow, so that the same will be driven with comparatively great power and with ease to said operator. The structure is such that all shocks or jars and the like imparted to the plow will be absorbed by the structure and not transmitted to the operator. The plow comprises a plow beam, handles secured to the rear ends thereof, a stem journaled in the front end of the beam and having a depending yoke, a wheel journaled in the yoke, a bowed spring connected to the stem, said spring and stem having interfitting teeth normally holding the same against relative adjustment, a push bar connected at its front end to the spring, and a cross head carried by the push bar and disposed between the handles.

Frank J. Pioch, Provo City, Utah. Sheathing.—The object of this invention is to provide a simple structure wherein the parts may be made of fire-proof material, as sheet metal, so that the whole is more capable of resisting fire than those employing wooden attaching means, and at the same time, said structure may be readily and cheaply manufactured. It consists of a sheet metal furring strip comprising a body portion having at one edge an offset attaching flange and at its other edge an offset hook portion forming a seat and provided with an outstanding terminal, a sheet metal sheathing member having a laterally bent hook portion forming a correspondingly disposed seat to receive the outstanding portion of the furring strip hook, said sheathing member being furthermore provided with an intumed terminal that engages in the seat of the furring strip.

Augustus W. Drake, of Lattimer Mines, Pa. has obtained a patent on a Compressed Air Water Elevator.—It has for its object to provide an exceedingly simple mechanism of a novel nature, which is compact so that it may be readily introduced into a well of small bore, does not depend for its operation upon an air-tight well casing, is economical in the use of air, and furthermore, is made up of parts or elements that are not liable to leak or become deranged in practical operation. The invention embodies an upright delivery pipe, a circular single piece tubular casing ring snugly surrounding the upper end of the delivery pipe and separate therefrom, said ring having a plurality of integral nipples depending from its under side, a plurality of supply pipes threaded into said nipples and extending downwardly alongside the delivery pipe and on opposite sides of the same, said supply pipes having communication at their lower ends with the delivery pipe at different depths, valves for controlling the passage of fluid through said pipes, and means for supplying fluid under pressure to the casing ring.

Andrew C. Mortenson, Santa Barbara, California. Door.—This invention relates more particularly to swinging doors, and the principal object is to provide means which permit the swinging of an ordinary door in opposite directions in order to permit the more convenient exit and entrance of persons, particularly where the space about the door is confined or limited. The invention consists in the combination with a door frame having spaced jambs, of a swinging open frame having spaced upright side bars, a threshold plate connecting the lower ends of the bars and swinging therewith, a brace connecting the plate and one of said bars and extending across the space between the same, said brace being located at one side of the door, hinges connecting one of the side bars of the frame and one of the door jambs, a door that fits within the frame, and hinges connecting the door and the other side bar, said door being arranged to abut

against the exposed portion of the brace and extending across the space between the plate and bar, and said brace thus constituting a stop for the door.

William J. Birchell, Los Angeles, California. Fender.—This invention relates to improvements in car fenders or pilots, and the principal object is to provide a simple structure of a novel nature which will prohibit an object passing beneath a car, and will have an unobstructed outer rolling surface to direct the object struck thereby to the sides of the car. The fender of this invention embodies a substantially V-shaped frame comprising upper and lower substantially V-shaped bars and tie rods connecting the bars, the lower bar consisting of sections and having sockets located partially in each section, and rollers having gudgeons at their upper ends that are journaled in the upper bar, said rollers projecting below the lower bar and having gudgeons in their lower portions that are in the sockets.

William S. Shirk, Anderson, Ind. Calendar Clock.—Mr. Shirk has patented an improved calendar clock of that character in which a dial separate from the time-dial is employed, the day of the month being indicated by a pointer in connection with a circular series of thirty one numbers on the dial. The names of the days of the week and the numbers of the days of the month are printed on cylinders located in the rear of the dial, said names and numbers appearing in their proper order through openings in the dial, and the calendar being connected with, and actuated by, the time movement of the clock. The invention consists of a supporting frame, a dial covering the same and having upper and lower openings therethrough, upper and lower cylinders journaled on the frame behind the openings in the dial, said cylinders carrying toothed wheels at corresponding ends, a shaft journaled on the frame between the cylinders and carrying a pointer operating over the dial, a vertically reciprocating and oscillatory actuating rod extending across the ends of the cylinders having the wheel, a cam for effecting the reciprocation and oscillation of the rod, a dog rigidly attached to the rod and movable into and out of co action with one of the wheels, and vertically reciprocating and oscillating means mounted on the rod and co-acting with the other wheel and the shaft for effecting the movements thereof.

Harry E. Babione, Woodville, Ohio. Hen's Nest.—It is the aim of the present invention to provide a novel structure of this sort that will properly take care of the eggs as fast as they are laid therein, removing them from the reach of the hens, so that they cannot be eaten, and will not be broken, and are kept entirely clean. The invention comprises a nest casing having a side entrance and an inclined bottom, walls forming an inclined passageway having communication with the nest, a closure pivoted within the casing and movable across the entrance, a perch pivotally mounted below the entrance and outside the same, a connection between the perch support and closure, a lock for holding the closure against movement, a spring for moving the lock, a connection between the spring and lock, a trigger for holding the spring under tension, a gate hinged at the lower end of the passageway and having a connection with the trigger, said passageway having a bottom provided with an opening, a plurality of traps located in the bottom and arranged to be successively operated by eggs passing through the passageway, and a plurality of egg-receiving bags suspended beneath the traps.



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FOR SALE—Patent No. 852,385, dated April 30, 1907. The Holbrook Fruit Cooker. It is also an improvement on the air tight heater. Saves fuel, time and labor, is useful and ornamental. Address, M. F. Holbrook, Longview, Texas. oct

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FOR SALE—Patent No. 856,008, dated June 4, 1907. Four-way Gate Hinge. Exceedingly simple and efficient. Cannot get out of order. Address, Lock Box 465, DeKalb, Ill. oct

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FOR SALE—Outright with privilege of obtaining foreign patents. Patent No. 856,025, dated June 4, 1907. Head Rest and Pillow Holder. Adjustable. Any reasonable offer considered. Address, Mrs. Alice H. Brown, Ludlow Station, R. F. D. 2, Box 55, Covington, Ky. oct

FOR SALE outright or on royalty—Patent No. 845,551, dated Feb. 26, 1907. Harvesting Apparatus. Has been tested. A success for heading kafir corn, maize, sorghum, etc. Address the inventors, Russell & Armistead, Abilene, Texas. aug

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FOR SALE—Patent No. 853,043, dated May 7, 1907. Metallic Tie and Rail Fastener with concrete foundation. Greatest invention of the day. For particulars write to Robert M. Toy, Jones Station, Pa. aug

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FOR SALE—U. S. Letters-Patent No. 849,995, dated April 9, 1907. Improvement in Stubble Turners. This is the only automatic stubble turner on the market to-day. It is for sale at a bargain if taken at once. Address, Irving Harker, Dodgeville, Wisc. sep

FOR SALE—Patent No. 827,866. Device for cleaning rifle shells to reload. Simple, durable and cheap. For particulars &c., write the inventor John H. Hart, No. 3507 North 7th St., Tacoma, Wash. sep

FOR SALE—A patent on Burglar Trap and Alarm. No. 845,624. Sure to catch your man. Suitable for banks, post-offices, stores, dwelling-houses, cars, any place where valuables are kept. Address, Joseph Gaynor, Bolster Place, Barre, Vt. aug

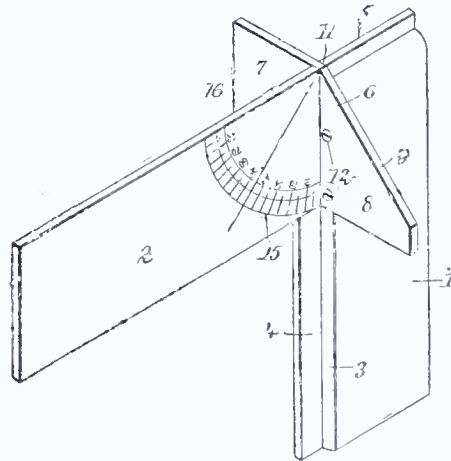
FOR SALE—Patent Oct. 4, 1904, others pending. The automatic change maker register. A coin receiver and a coin deliverer; a big business opportunity; it will take the place of registers. For particulars write Wm. W. Roblyer, Norwich, Kansas. aug

FOR SALE—Patent No. 810,614, dated January 23, 1906. Ax Holster and Guard. A useful article to carry all kinds of axes and keep them sharp and not cutting anyone. Also keeps them in good order. Address, J. G. Busch, Potter Valley, Cal. sep

FOR SALE—Patent No. 759,143. Live Minnow Bucket. Guaranteed to keep minnows alive as long as needed. Address, Wilson & David, Epes, Ala. Oct

FOR SALE TRY SQUARE.

U. S. Patent No. 834,872, issued Oct. 30, 1906.
Canadian Patent No. 703,377, issued Jan. 29, '07.



Every new part is valuable: the short blade at right angles to long blade for marking two pieces simultaneously. With the 45° blade, also the long blade, two pieces can be marked simultaneously. One bevel and one square or straight line. The tongue longitudinally along the stock holds the square in exact and proper position for either marking bevel or square work. With the 90° arc any angle can be got with a bevel square without wasting time to figure out the desired angle. For exact and speedy work no carpenter can afford to be without this square. For bench work it is indispensable. It is simple and can be manufactured very cheap. Will sell patent outright for United States and Canada. Address, James Callie, Lake Linden, Mich.

WANTED.

WANTED—One coach and wagon builder in each state of the U. S. A. to buy the right to use and operate my section brake. Patented April 16, 1907, No. 850,730. Particulars on application address, Joseph Carr, Lexington, Mo. oct

WANTED—Traveling salesmen calling on the retail hardware to sell my patent window lock. Prevents burglars from entering whether the window be open or closed. Full of merit, liberal commission. Address, James Power, No. 9 Spruce Street, Methuen, Mass. sep

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The Patent Office.

The condition of work in the Patent Office has often received editorial comment in these columns, but until there is an improvement in the situation, it cannot too frequently be brought before the public. We venture to say that of the millions of inventors who have applied for patent protection, a very small proportion have failed to experience amazement and disgust at the delay to which their applications were subjected. It is true that, as pointed out in an editorial some months ago, there has been an effort during the past year to bring the work more nearly up to date; but all such efforts, while laudable in themselves, serve but to show the inadequacy of the means employed to this end. It is a lamentable state of affairs when an application for patent, instead of being taken up within a day or two after its receipt by the Patent Office, is forced to lie in the files for weeks and months—before it is even considered for the first time; and then it is subject to amendment, and each amendment is forced to undergo a corresponding delay; until finally, when the patent is issued, its value is often impaired. Our enterprising business men, accustomed to modern methods in the transaction of their affairs, find this delay of serious moment. They are waiting for action by the Patent Office in order to proceed with schemes for developing industries, and to have this action postponed for a couple of years may mean ruin to their plans. Further, the delay in itself creates additional congestion and confusion, for it means that thousands of letters inquiring as to the status of applications must be answered, which would be avoided if cases could receive prompt action.

In all this, there is no desire to reflect upon the present corps of Examiners in the Patent Office. As the Commissioner said in his last annual report, and as we are glad to add our testimony, they are a body of hard working and intelligent men, and due credit should be given their efforts to reduce the number of pending cases.

They have worked after office hours, and have succeeded in cutting down the list by a few hundreds. But when it is considered that about a thousand new applications are received every week, the futility of their struggles is apparent. The enormous increase in industrial prosperity in this country during the last decade has meant a proportionate increase in the work of the Patent Office. As well try to dam Niagara with pebbles as to cope with the torrent of applications pouring into the office, with the present force. There are less than three hundred examiners—a ridiculously inadequate number. Nor is this the only drawback. The remuneration is far below what it should be for such hard work, and such technical work. They are very poorly paid. If the force were increased four or five times and their salaries doubled, there might be a chance of retaining the services of trained men, and of catching up with the work. As it is now, the service is being further crippled by the retirement of examiners who are offered more advantageous terms in private industries and whose places must be taken by relatively inexperienced men. Some of the best Examiners have been lost within the last year, and they can ill be spared.

The cure for these evils, as indicated, is to use the surplus credited to the patent fund—a surplus amounting to \$7,000,000—to employ additional examiners and to increase the salaries of the present force. Instead of having to consider a dozen cases a day, which must involve hasty and unjust action; instead of being crushed with the knowledge that the surplus of new applications before the office is mounting up towards fifteen thousand, and is increasing every week, each examiner should be permitted to take his time in the consideration of cases. He should not be asked to examine more than four or five a day, or in instances where the inventions are complicated and the work involved is greater, not more than two. It should be made worth his while to remain in the Government service. The force should be increased until applications could be taken up on the day they are received, and final action could be had within a month. Then our Patent Office would merit its present reputation, of being the greatest in the world.

Money Counting Machine.

Most people have been amazed while standing in a bank at the rapidity and accuracy with which the clerks count out the coins of all denominations. But even the great speed attained by the human hand controlled by a quick mind is not sufficient to meet the demands of present commercial progress. A machine has been brought out which does this work automatically, counting the coins and rolling them securely in a paper wrapper. The *Pathfinder* describes the apparatus as having a kind of hopper at the top of the machine into which the coins are emptied. They issue below counted and wrapped, the work being done as fast as six men could do it. It is claimed that the machine cannot make a mistake. It is operated by an electric motor.

Cloth from Paper.

The new use of paper, an account of which appears in another column, is of sufficient importance to deserve more than passing mention. The versatility of paper has more than once been commented upon in these pages, and descriptions have been given of the several uses to which it may be put; but the latest application promises to be the most far reaching in its economical results. It amounts practically to the discovery of a new material with the softness of cotton and the durability of linen, and far cheaper than either. To come to practical examples, what housekeeper will fail to welcome the opportunity of buying towels in all respects equal to linen, for twenty-four cents a dozen? What workman will not seize the chance to buy overalls costing only one third the price of cotton ones and one tenth that of linen ones, and wearing better than either? That these figures are not fanciful is proven by the fact that last year alone seven million of these towels were made and sold in Germany, where the invention has its origin; and although we have not yet had the articles introduced into this country, it is only because the local demand has been too great (as we are not surprised to hear) to permit of exportation. Very soon, however, the articles will be upon our own markets, and we shall have a chance to test them. It is reported that the spun paper fiber finds application for outing hats, for shoes to replace the canvas footwear to which we are accustomed, and especially for suits for camping, hunting and other open air wear. A peculiar feature when the paper thread is used in garments of medium thickness, we are told is the resultant warmth. It possesses the advantage of lightness, compared with an equal bulk of linen or even cotton, and the cost of the material for a full three piece suit of clothes of average weight is not over \$1. It can be made to look like a good grade of duck, and is an excellent material for wear in the Tropics, on account of its porosity. It is also reported that the new textile has been most successfully used for sacks, for carpeting, and for wall hangings and furniture coverings. When used for mural decoration the material may be applied with paste or nailed, and the delicate coloring that the paper fiber takes renders the tapestries most effective. For upholstering furniture for porches, etc., the material has an advantage beyond its decorative qualities, in that it is not subject to injury by light or dampness, even rain failing to harm it. Altogether, the new material promises to work a revolution in the textile trade, and we shall look forward with interest to its arrival in this country. The process of preparing the new thread which is spun from wood fiber, is of course a secret one, and is patented in all civilized lands. The inventor intends starting mills in the United States, where the necessary raw material is abundant and of fine quality.

Great Wireless Station.

The far flung islands of the Pacific are to be bound together with the invisible chains of wireless telegraphy. From tall towers on the top of a California mountain, an electric current of unprecedented voltage will flash signals which may be heard not only in Hawaii and distant Samoa, but even on the eastern shores of Japan and the Philippines: while, at the same time, ships moving like atoms across the face of the waters, may keep in constant touch with land.

An interesting article by J. Mayne Baltimore, in a recent magazine, describes this wireless installation on our far Western coast. Rising 300 feet into the air, the two great towers have just been placed in position on Mount Tamalpais, 12 miles north of San Francisco. Their bases are 2,600 feet above sea level, and are only a few miles from the ocean. To construct these towers, convey them to the pinnacle of the mountain, and hoist them into vertical position was a most daring feat of modern engineering. It must be borne in mind that each tower was hoisted intact. They are made of strong Oregon fir, bolted and braced with steel, and each weighs 60 tons.

In hoisting the giant, two powerful crab capstans, massively anchored to the solid rock, were used. Huge crossed masts, or "shears" were first erected, from which extended a heavy cable to the prostrate tower, around which were eight lashings. The first was 150 feet from the base, and the last 50 feet from the top. By "bridles" these lashings were joined in various groups. The last represented the main purchase of the cable in hoisting each tower.

It was not possible for men working on the steep side of the mountain to "pay out" the guy cables uniformly, as the towers rose; so cavils were arranged on the front legs of the towers, at the heels, and every guy wire came to a cavil. Thus, with the combined power of donkey engine and capstans, and a large force of men, the huge towers were slowly hoisted into a perpendicular position. Once upright, the base of each was securely anchored, and the upper parts braced by powerful steel guys, the lower ends of which were fastened to solid rock. In addition, six strong steel cables were stretched, at regular intervals, between the base and top of the towers, to support the intricate network of wires, and to hold more securely the towers against the fierce gales. They are so firmly set that they can resist any wind short of a hurricane.

The induction coil measures 15 feet in length, and weighs approximately 4 tons. It will throw a spark 15 feet long and as large as a man's body. Two thousand miles of silk insulated wire will be required in building this immense coil, and in controlling its enormous potential of 5,000,000 volts, at least 3,000 pounds of copper wire will be suspended between the two great towers.

Proper insulation presented a serious problem. More than a ton of specially prepared paper and beeswax

is used in the huge coil itself, and it is enclosed in a double glass case with rubber padding between the plates to prevent their being damaged by the heaviest electrical discharge. The aerial wires are protected by glass and rubber, and on the guy wires blocks of Australian iron bark, tested and boiled in paraffine, will aid in preventing any appreciable loss of current through the atmosphere.

Track Laying Machine.

It was to be expected that railroad construction, as well as everything else in this age, should be done by machinery. A track laying apparatus has been invented that works well and swiftly. It is operated by a 20-horse power single engine, the steam being supplied from a locomotive through a pipe line. Connected with the machine are 13 trams, which move continuously by means of an endless chain, and carry ties on star-pointed rollers to the front of the machine. The device can lay track at the rate of 3 miles a day, and is a great labor-saving device.

Concrete Protection for Piles.

Still another use has been found for concrete, and that is in protecting piles under water. The device consists of a cylindrical mold made to surround the pile, into which the protecting sheath of concrete is poured. This mold is made of two semi cylindrical forms of galvanized iron, whose longitudinal edges are covered with compressible material closing in a water tight joint, and held in position by jointed clamps, thus enabling the mold to be placed around any pile. After the water has been pumped out of the mold, concrete is poured in and the mold remains in position until the concrete has hardened. The advantages of the device lie in its unlimited durability, its immunity from the ravages of the teredo, etc., and its cheapness.

New Motor Boats.

French designers are at the forefront in models for submarines and motor boats. One of the latest is a combined automobile and boat, adapted to run either on land or water. The machine has the shape of a boat, with small wheels at the side; in this form it is an automobile, but when it enters the water connection can be made with a screw propeller.

Another novelty is a motor boat designed to slide over the water instead of cutting through it. This result is effected by the peculiar shape of the under part of the vessel, which slopes backward slowly from the bow to a maximum depth at about the centre of the craft, somewhat like the smooth under surface of a saucer. It is said that this boat, which somewhat resembles a submarine, can make a speed of 32 knots, if given powerful enough machinery.

The Thermophone.

One of the most ingenious of recent inventions is connected with the cold storage business. It consists of an instrument that measures heat at any place that may be desired, and trans-

mits it to the ear by means of sound. It is well known that there is a change of resistance in an electrical conductor corresponding to a change in temperature, and the thermophone takes advantage of this fact. Stations in various parts of the plant are connected with the central office, which is provided with a series of switches and a dial—similar to that of a thermometer—showing the degrees of temperature. A receiving telephone is connected with the switchboard. The operator connects the telephone with any desired station in the plant and places the telephone to his ear. He hears a slight buzzing noise and the needle on the dial moves. Finally there is silence, and at that instant the needle shows the precise temperature.

Detection of Fire Damp.

Efforts are constantly being made by all countries interested in mining, to reduce the dangers attendant upon that most perilous of pursuits. Great progress in this direction has been made in Germany, where mine accidents, up to a few years ago, were numerous and calamitous. Thanks to the application of various preventive measures, the percentage of mortality has much diminished of late. A Strassburg paper records a discovery by a German professor, of another device to promote safety in mines. By the use of this apparatus, the presence of fire damp in the air of a mine may be determined even when the gas is present in the atmosphere in so small a proportion as one-two hundredths of one percent. The article says that the invention consists of a column of metal, supporting above a cup and below a rod, connected with an electric current. Between the little inverted cup at the top and the rod below is placed a graduated tube, bell-shaped, into which is introduced the gas for analysis.

Experimenting with his invention before spectators, the discoverer demonstrated, by a simple calculation, that the explosive mixture used in his test contained 5 volumes of fire damp for fifteen volumes of oxygen, and thirty of air, which is introduced to moderate the effects of a too violent explosion. By this invention, it is declared, it will be easy to determine the presence in the air of a mine of the existence of fire damp as soon as it is present, and before it can accumulate in sufficient quantities to become dangerous.

Artificial Silk.

The manufacture of artificial silk from wood pulp instead of through the slow and laborious efforts of the silk worm, is one of the newest industries. For years attempts have been made to replace the natural by some artificial product, but it is only within a comparatively recent period that these efforts have been crowned with success. It is admitted that the imitation silk has its limitations. It is true that the thread resembles real silk closely in appearance and to the touch, but it does not wear well. Its fabrication into cloth without the admixture of other fibers is not recom-

mended, but it is becoming popular as the material for stripes and small figured effects in cloths of cotton or wool.

Two processes are employed in making artificial silk—one in which alcohol is the dissolving agent of the wood pulp, while in the other a caustic solution is employed. The raw material comes in the form of baled sheets of pulp, each about 4 feet square. The pulp is first dissolved into a liquid of the required consistency, and then forced through a series of microscopic holes punched in a thin platinum plate. An acid bath fixes the filaments so that they can be twisted together to form a workable thread. Usually either 16 or 32 of these capillary filaments go to form what may be termed the "single" yarn. The spinning spindle, which is gear driven at 5,000 revolutions a minute, carries a cup, into which the yarn is collected in the form of a small "cheese." A recent invention provides for feeding the pulp through the microscopic holes, at the same time enabling a varying pressure to be exerted on the liquid, and by this contrivance more different counts of yarn can be made than could be conveniently produced by the older arrangement of increasing or decreasing the number of component filaments in the finished thread.

There is a wide demand for artificial silk, as its price is much below that of the genuine product. Its chief rival is mercerized cotton. Its main disadvantage is that it is inflammable, and it is also affected by moisture; on the other hand, its brilliancy and lustre are far superior to any mercerized goods. The exploiters of the new product expect that before long, their yarns will have a settled position in the textile trade between silk and the best qualities of mercerized cotton.

Paper Clothes.

A new material has entered the markets of the world to compete with cotton and linen in the manufacture of garments, and that is paper. Prepared by a special process, it presents remarkable advantages, being much cheaper than either of the textiles named, while combining their good qualities. The thread is not brittle, it does not have a hard surface, and it neither shrinks nor stretches to any appreciable extent. Having certain resilient qualities it cannot be readily crushed or dented like paper, and moisture has no effect on it. When bleached the thread is pure white, and at first glance cannot be distinguished from cotton. It is a serviceable substitute not only for this material, but for silk or—wide extreme—for jute.

A Saxon inventor and manufacturer, our Consul at Plauen reports, deserves the credit for the utilization of paper wood fiber in this new and practical way. The production of this paper yarn, and the extreme cheapness of the new material compared with other yarns now in use, is really a remarkable achievement. It should be added that this is no haphazard discovery, but rather the logical result of years of painstaking

study and experiment. After the final development of the theory at first in mind into tangible material for all manner of uses in textile industries, the paper thread and yarn, loose or tightly spun, of all thicknesses, have been woven into almost every conceivable fabric. They have been tested and retested, until the invention is acknowledged to have achieved an important commercial success. The paper yarn has extraordinary wearing properties, and as the full scope of its usefulness has probably not been determined, it will, in all likelihood, lend itself to other purposes yet to be discovered.

Being paper, the yarn can be more readily dyed in delicate shades than other textiles, far outmatching the range of colors to which cotton or silks are susceptible, and still more, those of linen. The hues are durable, even the most delicate being unaffected by strong light. If a manufacturer should wish to combine the paper thread with other materials, it can be done in any proportion desired. It should be understood that the new thread is of wood fiber, and although of the same material as paper, it is not used in sheets and has nothing of the nature of papier mache. It is employed only for weaving, and can be used on a loom adapted for cotton or linen.

Among the various fabrics of which the new material has been used with marked success are rugs and carpets. Here the heavy yarn, woven into beautiful designs, is found to possess great advantages. The rugs are elastic, do not retain dust, and are easily cleaned by beating or washing. Another great field for the paper yarn is the manufacture of bagging, as it is a practical substitute for the more expensive jute. It has been found best, however, in making sacks to mix one thread of jute with two of paper, as the combination secures the advantages of jute gunny cloth and the lightness and cheapness of wood paper. Closer woven, equally strong, and at one half the cost, it can replace with advantage the jute sacking now in general use. Inasmuch as the production of jute is localized and the demand for it steadily increases, the new material will make the users of sacking more or less independent of the jute market—a fortunate thing, in view of the prevailing high prices. Sacking made of the combination of paper and jute is said to be a cleaner and a neater fabric, and not as heavy. The output of this combination sacking is already huge, and it is believed that in the near future it will be a formidable rival of jute the world over.

Paper thread is also adapted for many garments—hats, shoes, overalls, and, from its combination of warmth and lightness, for underwear. There seems, indeed, to be no limit to the uses to which it can be put, and it is good news to hear that factories are to be established in the United States. Already it is the basis of active industries in England and Bohemia, as well as Saxony. Its many admirable qualities, coupled with excessive cheapness, are bound to make it an article of practical and extensive beneficence.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,

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Weighing apparatus..... A. Harrington
Weighing machine, Automatic..... G. Hoepner
Wet slitting machine..... A. G. Brewer
Wheel spindle and axle..... T. J. Lindsay
Wheels, Pneumatic cushion for vehicle..... H. E. Bradley
Winding machine..... J. E. & J. Broadbent
Window..... W. H. Barriere
Window frame and sash..... W. H. Barry
Window sill, Metallic..... W. Corbett
Wines and spirits and sterilizing liquids, Ameliorating..... V. Dorn
Wire stretcher..... R. B. Hartin
Wire working tool..... J. J. Albert
Wood, Waterproof uniting pieces of..... C. Wittowsky
Work box..... F. T. Howe
Work holder..... A. E. Booth
Wrench..... H. W. Simms
Wrench..... E. F. Smith
Wrench..... J. A. Scott
Wrench..... D. P. Kahle
Wrench..... F. C. Magenheimer
Wrench and can opener, Combination..... W. A. Rich

DESIGNS.

Badge..... L. H. Brunner
Badge..... 3 pats..... C. H. Dieges
Cabinet, Hotel..... J. Q. Adams
Casket or similar handle..... N. L. Barmore
Cigar band or wrapper 2 pats..... L. C. Wagner
Fabric, Pie..... F. E. Kip
Ice tub..... J. E. Straker, Jr
Phonograph horn..... M. Steiner
Piano case..... J. H. Ludwig
Spoons, forks, or similar articles, Handle for..... G. L. Crowell, Jr
Stocking..... J. J. Curry

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Acid, Manufacturing dialkylbarbituric..... M. Conrad
Adding and subtracting machine..... J. C. Renner
Adding machine attachment..... A. Pentecost
Addition, Apparatus for..... G. Nahlik
Adjustable stand..... H. & A. J. Buckland
Adjusting device..... H. G. Beede
Aerial vehicles and other structures, Connection device for the frames of..... A. G. Bell et al
Aerial vessel..... L. D. Merrick
Airship..... W. Hull
Alloy, Aluminium..... A. Chambard
Alloys, Production of calcium..... F. von Knechtgen et al
Ambulatory wheel..... W. T. Jones
Anchor compartment..... S. A. Fraser et al
Animal trap..... J. M. Kellogg
Animal trap..... C. F. Lamp
Animal's from stables, Means for releasing and leading..... A. T. Ruthven
Arch support..... D. Livignano
Ash and garbage receptacle, Combined..... J. Kolouch
Assembling apparatus..... N. Marshall
Atomization apparatus..... W. L. Root
Automatic switch..... G. Matthews
Automobile wheel..... J. R. Barker

Automobile driving mechanism..... F. J. Newman
Bait hooks, jiggers, and like angling devices, Attachment for..... J. W. Hayward
Baking powder and making the same..... 2 pats..... O. Best et al
Ball bearing wheel..... F. J. & H. J. Hansen
Ball support..... F. B. Piper
Ballet chiming and crozing machine..... C. J. Alley
Basket machine..... B. S. Noe
Bathing chair..... G. N. Moore
Bearing..... J. C. Cromwell
Bearing, Ball..... J. Barthel
Bearing, Ball..... W. Nice, Jr
Bearing for water meters..... E. E. Gamon
Bearing, Roller..... J. A. Perkins
Bed bottom fabric, Wire..... H. Richardson et al
Beet pulling machine..... E. A. Smith
Bell..... P. C. Arnold
Belt, apron, canvas, or conveyer tightener..... G. E. Clarke
Belting, Steel metallic..... U. S. Balch
Binder, Temporary..... J. H. Parkes
Bit..... J. C. Dunks
Blank feeding mechanism..... C. Dancel
Block signal system..... E. F. Bliss
Block signal system, 4 pats..... L. A. Hawkins
Block signal system..... C. C. Anthony
Bow gun..... J. Schultz
Boat lashing device..... H. Berg
Boats, Modeling for speed..... J. F. Twigg
Boiler flue..... J. H. Davenport
Boiler tube cleaner 2 pats..... W. S. Elliott
Books backs, Forming..... A. J. Kroencke
Book or pamphlet..... J. A. Ward
Bookcases, Aligning device for sectional..... C. J. Lundstrom
Boots and shoes and leggings, &c. Fastening..... W. M. Malone
Bottle..... G. E. Nolan
Bottle and jar stopper or closure..... F. A. Bird
Bottle closure..... V. J. G. Freund
Bottle holder..... A. J. & E. A. Schuh
Bottle, Mucilage..... L. H. Smith
Bottle, Non-refillable..... F. W. Johnson
Bottle, Non-refillable..... E. C. Schilling
Bottle, Non-refillable..... I. I. Kremer
Bottle stopper..... G. Kitzgaard
Bottle stopper, Non-refillable..... G. B. Okey
Box..... F. H. G. Morse
Box opening device..... J. E. Lee
Braiding machine..... R. C. Rahm
Braiding machine carrier..... F. Duenkel
Brake construction..... V. Lamb
Brooder..... D. K. Giff
Brush..... F. F. Mumford
Brush..... J. M. Aufesser
Brush and mop holder, Combined..... G. A. Fraser
Brush, Fountain glue..... A. D. Hyman
Brush holder..... W. O. Cutter
Bucket, Self dumping..... B. A. Baus
Buckle..... J. J. Buchanan
Buckle..... J. A. Wilson
Bulging roll..... M. Prevost
Building block machine..... W. J. Armbruster
Burglar alarm..... K. E. Hartmann
Butter, oil, sard, and fats, Apparatus for renovating and refining..... C. C. Martin et al
Butter oils, Pneumatic agitating tank for..... C. C. Martin et al
Butter, Renovating and refining..... C. C. Martin et al
Button, Collar or cuff..... T. H. Sparks
Buttonhole stitching machines, Needle bar mechanism for..... E. B. Allen
Cabinet, Medicine..... O. Jaeger
Cabinet, Rotary stand..... A. H. Case
Cabinet, Thread..... C. E. Dove
Cable roller..... W. Callahan
Calculating machine..... L. G. Jullien
Calling device, Automatic..... W. O. Beck
Camera focusing screen..... F. A. Brownell
Candy making machine..... W. T. Hudson et al
Candy spinning machine, Controlling an electric..... A. D. Robinson
Canning apparatus..... J. K. Pharr
Cap..... M. L. Glass
Car coupling..... E. F. Pendexter
Car coupling..... W. F. Kiesel, Jr
Car grain door..... W. C. N. Smith et al
Car grain door..... J. Edman
Car, Pressed steel..... W. G. Wagenhals
Car ventilator..... G. L. Archer
Car wheel..... 2 pats..... T. S. Blair Jr
Car window cleaner..... T. J. Short
Cars and the like, Safety guard or fender for tramway..... G. Hanff
Cars, &c. Driving gear for motor..... L. Iversen
Carbureter..... W. H. C. Higgins, Jr
Carbureter..... T. McCormick et al
Carbureter for hydrocarbon engines..... T. Huber
Carriage feed mechanism..... F. Nendorff
Carriage storm protection..... M. D. Stocking
Cartons, Manufacture of moisture proof..... H. G. Eckstein
Cartridge, reissue..... H. Maxim
Cash recorder..... A. F. Staples
Cash registering till..... J. A. Prestwich
Casting apparatus..... 2 pats..... H. B. Doehler
Castings, Mold for making steel..... C. Hagstrom
Caustic pencil holder..... C. J. Requa
Cellulose, Manufacture of threads, films, or other forms of..... M. Fremery et al
Cement or concrete construction, Armored..... G. Ajello
Centering construction..... C. H. Scammell
Chain..... J. Kingston
Chain..... R. W. Dull
Chain..... 2 pats..... W. T. James
Chain snap..... P. J. Scanlon
Chain snap hook, Watch..... E. L. Robinson
Chain, Weldless..... S. K. von Esegby
Chain wrench..... H. J. Kahne
Chair fan attachment, Rocking..... J. E. Gilbert
Cheese cutter..... G. F. Kriesel

Cheese cutter..... W. G. Templeton
Cheese cutter..... J. W. Culmer
Cheese cutter..... A. K. Gillespie
Cheese cutter, Computing..... T. C. Brskett
Chlorination barrel..... W. J. Armbruster
Chuck, Drill..... F. G. H. Heynau
Chuck, Rock drill..... C. A. Hulquist
Chuck..... W. L. Chilton
Cigar boxes, Device for preventing the fraudulent refilling of..... T. M. Leslie Jr
Cigar bunching and wrapping machine..... J. A. Bach
Cigar holding attachment..... W. C. Oliver
Cigarette machine pasting apparatus..... G. Tickner, Jr
Circuit breaker..... B. P. Rucker
Cistern mold..... W. B. Dorward
Closet attachment..... F. M. Jacob
Closet..... F. H. Palmer
Clothes line prop..... R. I. Williams et al
Clothes line reel..... C. D. Dittman
Clutch, Friction..... W. H. MacDonald
Clutch, Friction..... C. J. Gadd
Coaster brace and beam, Sheet metal..... W. Schwene
Coaster brake..... A. Larsen
Coating pipes and other articles, Apparatus for..... D. A. Custer et al
Coke working apparatus..... G. F. Myers
Collar, Horse..... J. F. Moit
Collars, cuffs, and the like, Creasing and folding machine for..... H. Gerhardt
Color combinations in rooms, Exhibiting device to show harmonious..... W. Church
Colter clamp, Adjustable..... J. H. & R. L. Allin
Combination lock..... A. W. Hoag
Combustion engine..... J. H. & J. W. Bense
Commutator brush..... R. Siegfried
Computing device..... C. W. Draper
Concrete blocks and artificial stone, Mold for..... W. A. Benton
Concrete building blocks and artificial stone, Machine for molding..... R. Edmondson
Concrete gutter..... M. F. Howley
Concrete side walk..... D. G. MacDonald
Conveyer..... W. T. James
Conveyer..... A. H. Dahl et al
Cooking utensil..... M. C. Bacon et al
Cooking utensil..... J. Behringer
Cooking utensil holder and sad iron heater, Combined..... M. B. Bassett
Corn hanger, Seed..... C. D. Snyder
Corn silking machine..... I. S. Merrill
Cotton compress or baling machine, Portable..... J. W. Phillips
Cotton separator..... W. A. Patterson
Coupling..... O. A. Morris
Cradle, Self locking..... L. C. Hantske
Crater, Fruit..... C. C. Teague
Creosote and product thereof, Treating..... A. G. Meyer
Crop thinner..... A. B. Downs
Crushing and grinding mill, Vertical..... T. L. & T. J. Sturtevant
Crushing rolls for ore, rock and other material..... T. C. Walker Jr
Culinary utensil..... J. H. Collins
Cultivator foot..... C. L. Ferriott
Cultivator harrow attachment, Corn..... C. J. Kirkeberg
Current motor, Alternating..... B. G. Lamme
Curtain fixture..... P. A. Houghtaling
Curtain rod and making it, Extensible..... C. H. Thurston
Curtain roller..... H. F. Evans
Curtain supporting bracket..... E. O. Bulman
Cutting and folding machine..... R. C. Seymour
Cutting and mixing mill..... H. U. Prindle
Dental articulator attachment..... M. H. Knapp
Derailing switch..... M. H. Mahar
Derricks, Boom point for..... R. F. Bennett
Disk meter..... F. E. Gamon
Display rack..... F. P. Sawyer
Dolly, Jam..... J. Weimer
Door..... A. Ritter
Door check..... M. L. Hair's
Door hanger..... A. J. Ricker
Door hanger..... W. McDonald
Door lock..... A. J. Berger
Doors, Combined hanger and track for edge-wise movable..... D. Schuyler et al
Dough molding machine..... C. A. Thomson
Drawers..... E. Lanouette
Drawing board..... E. Werner
Dredger cutter 2 pats..... J. F. Oilrich
Dressing implement, Rotary..... C. E. Campbell
Driers, Cylinder for mechanical..... W. M. Cmmmer
Drilling device..... L. K. Moore et al
Drilling machine..... D. E. Krane
Driving and reversing gear..... R. J. Brooks
Driving mechanism..... M. B. Church et al
Drop light fixtures, Heat conductor for..... A. W. Reiser
Dropping device..... W. Dean
Duplicator, Rotary..... M. J. D. Carter
Dust pan..... D. W. Snider
Dye, Galloxyanin..... W. Lommel
Dye of the anthraquinone series and making same..... R. H. Scholl
Dyeing and bleaching machines, Return liquor system for..... R. P. Smith et al
Easel and plate holder, Combined..... S. McMichael
Electric controller..... R. V. Still
Electric fixture, High tension..... A. S. Marten
Electric heater..... J. S. Reynolds
Electric machine, Dynamo..... C. A. Mudge
Electric machines, Ventilating dynamo..... H. G. Reist
Electric meter..... A. J. Martin
Electric motor cooling means..... J. B. Wiard
Electric motor starter..... W. C. Mayo et al
Electric motors, Centrifugal switch for..... K. Tornberg
Electric sparking plug..... C. E. Reed, Jr
Electric vehicle control system..... W. Cooper
Electrical apparatus, Winding for M. B. Caus
Electrical contact joint..... R. H. Wappler
Electrical controller..... G. Laird et al
Electrical distribution system..... S. B. Storer

- Electrical controller for steam plants, &c. J. A. Olson
 Electrical heater and expansion coil M. H. Shueberg
 Electrical interrupter and rectifier H. A. Yarnell
 Electrolytic tank J. F. Miller
 Elevator brake M. Fullenlove
 Embroidery stand L. Tobriner
 Engine W. Robert-on
 Envelop E. F. Brown
 Eraser cleaner A. Larson
 Evaporating apparatus S. G. Lewis
 Evaporator F. Kleinschmidt
 Excavator G. W. King
 Excavating machine F. J. Lewis
 Excavator and levee builder. Combined trench C. C. Jacobs
 Explosive engine C. E. Maud
 Eyeglasses E. F. McKee et al
 Fabrics. Apparatus for applying fluids C. F. Kubler
 Fabrics. Applying small quantities of fluids on C. F. Kubler
 Fan C. T. Finkbeiner
 Fanning mill M. D. Collins
 Fare indicator C. Mascart
 Fastener P. H. Long
 Faucet. Beer F. E. Brueckner
 Faucets. Automatic shut off for J. C. Wright
 Feed mechanism for steam boilers. Chemical and water R. H. Fetta
 Feed receptacle or bag C. H. Avey
 Feed trough for poultry C. E. Baese
 Feeder. Boiler J. F. Senter
 Feeding mechanism 2 pats. F. G. Jahn
 Fence post or telephone pole J. R. Roach
 Fence posts. Machine for forming metallic P. J. Harrah
 Fence wire W. M. Dillon
 Fertilizer distributor. Hand W. S. Morgan
 File D. Johnson
 File cabinet D. F. Greenawalt
 Filter E. & F. O. Berdix
 Filter A. L. Anderson
 Filter container. Pressure C. W. Merrill
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 Fire and burglar alarm B. Stanb
 Firearm J. J. Murphy
 Fireproofing textile materials W. H. Perkins, Jr
 Fluid and oil burner L. B. Bullington
 Flying machine W. Phillips
 Forehearth C. M. Allen
 Fork W. Hazard
 Fork L. L. Pratt
 Form. Bosom A. R. Runyon
 Freezing apparatus F. Eckart
 Friction device V. G. Apple
 Furnaces. Device for feeding air to locomotive and other J. Milton
 Fuse. Inclosed R. C. Coe
 Fuse. Safety W. J. Phelps
 Game apparatus D. G. Black
 Garment hanger C. Clift
 Garment hook L. A. Yelzer
 Garment supporter C. B. Goldsmith
 Garment supporter R. Gorton
 Gas burner B. F. Jackson
 Gas burner igniting and extinguishing device O. S. Lied
 Gas burners. Automatic shut off for E. Tavasilla
 Gas washer G. Sailer
 Gases. Purifying G. Sailer
 Gate F. S. Rogers
 Gear case W. J. Reich
 Gear. Reversing F. G. Gies
 Gear. Variable speed S. T. Lewis
 Gears. Controlling mechanism for speed C. Wicksteed
 Gearing. Spiral C. A. Janson
 Generators. Load equalizer for S. D. Sprong
 Girdle. Bust N. Dunlap
 Glass making machine. Wire A. Shuman
 Glass melting pot. Continuous C. J. Crites et al
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 Grain bin ventilator J. Feehery
 Grain conveyor J. Feehery
 Grain elevator and dump J. Peterson
 Grain separator J. Feehery
 Grapple A. Landry
 Grate F. Kost
 Grate shaking mechanism F. N. Dillon
 Grinder. Face mill G. W. Smith
 Grinding machine H. B. Nichols
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 Grip cord adjuster. Automatic O. Pedersen
 Grocery bin D. H. Malone
 Guard H. P. Scofield
 Gun and carriage. Naval landing R. P. Stout et al
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 Hair pin cutter W. H. Goodale et al
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 Hammer S. S. Stuhag
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 Harness attachment N. C. Sikes
 Harrow attachment K. Schaal
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 Harvesting and threshing machine. Pea and bean E. & B. Tharp, Jr
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 Hat fastener F. C. Kavanagh
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 Hedge trimmer G. O. Hoppe
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 Hinge. Locking O. A. Bell
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 Horseshoe G. P. De Launey
 Hose coupling E. J. Hannold
 Hose. Flexible metallic W. Schulz
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 Hot air furnace J. P. Kolla
 Hub. Shock absorbing C. C. Griggs et al
 Hushing machine R. P. White
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 Hydraulic elevator R. H. Beebe et al
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 Hydrocarbon burner D. D. Walker
 Hygrometer for regulating humidifying and heating systems S. W. Cramer
 Ice cream freezer W. M. Milburn
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 Illusion apparatus F. J. Hafner
 Incandescent mantle. Self lighting G. Gotty
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 Indigo and making same. Tribromo derivative of G. Engi
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 Kodak film J. B. Ketchum
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 Ladder. Combination C. G. Davis
 Ladder. Extension I. R. Davis
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 Lamp socket. Electric J. Amos
 Lamps. Automatic gas feed vacuum tube D. M. Moore
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 Latch. Door C. B. Raupartner
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 Lock indicator A. R. Carlisle
 Loom. Kindergarten 2 pats. J. C. Tyndall
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 Looms when weaving. Humidifier for moistening the warp threads of T. F. Smith
 Lubricating system F. L. Hawkins
 Lubricator L. D. Pickett
 Lungs. Device for developing the G. M. Thomson
 Mail bag catching and delivering mechanism J. T. Jones
 Mail marking machine F. G. Jahn
 Maltling process H. Heuser
 Manifold mechanism H. D. Bolton
 Manure spreader G. G. Griswold
 Mattress J. R. Valentine
 Mattress C. J. Witzel
 Mattress stuffing machine S. A. Coffman
 Mattresses. Bed riser for woven wire J. M. & F. Holland
 Measuring instrument E. B. Stimpson
 Memorandum block H. Birnbach
 Milling machine cutter head F. D. Smith
 Miner's cage W. Massing
 Mirror. Illuminating A. D. Southam et al
 Mitering machine W. Battensby
 Mitering machine. Segment H. I. Buckel
 Mixing apparatus F. W. Kapheim
 Monoline machine J. McNamara
 Mop wringer H. Colby
 Mop wringing machine M. A. Elliott
 Mortar gage G. S. Ormsby
 Motion transmitting apparatus C. B. King
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 Mower W. W. & H. H. Hare
 Mowing machine J. W. Latimer
 Muff bed H. Fischer
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 Music leaf turner F. P. Parker
 Musical instrument A. T. Bond
 Musical instrument. Pneumatic self-playing L. B. Doman
 Musical instruments. Tracker box for mechanical W. F. Cooper
 Neck and chest protector N. Newman
 Needle threading device J. Welty
 Newspaper handling apparatus G. W. Frick
 Nozzle H. B. Sherman
 Nut. Lock 2 pats. C. Rystrom
 Nut lock J. O. Broadfoot
 Nut lock F. D. Parsons
 Nut lock W. W. Laughlin
 Nut lock H. Miller
 Nut ring E. E. Gamon
 Oil burner C. W. Phelps
 Oil burner A. J. O'Brien
 Oil burner. Air carbureting W. N. Best
 Oil distributing ring G. H. Follows
 Oils and fats. Bleaching H. A. Metz et al
 Oiling device. Saw H. Schuring
 Optical apparatus G. Heddon
 Ordnance. Breech operating mechanism for S. N. McClean
 Ores. Means for separating or classifying H. E. Wetherbee
 Ores. Separating or classifying H. E. Wetherbee
 Outlet box S. E. Huntington
 Overshoe retainer G. E. Ziegler
 Package. Label C. F. Fehrerbach
 Packing W. E. Sanders
 Packing. Piston R. R. Spears
 Packing. Piston rod G. Rothenbuecher
 Padlock. Sea F. Abrams
 Pail. Milk T. J. Hopkins
 Paper and other materials. Machinery for cutting and folding E. H. Cottrell
 Paper sitting machine J. L. Perkins et al
 Partition. Folding T. R. Boone
 Partition section. Interchangeable A. Adams
 Paste applying machine A. D. Clingman
 Pawl and ratchet mechanism D. C. Prescott
 Pea separating machine I. S. Merrell
 Pens, &c. Box for G. E. Chandler
 Phonograph attachment W. G. Horton
 Photograph printing machine H. H. McIntire
 Photographic shutter E. W. Parker
 Photograph shutter W. T. & C. C. Barber
 Piano keyboard W. D. Reaves
 Piano player F. W. Winter
 Piano player R. Morgan
 Pickling bath C. E. Lavery
 Picture and making same. Colored H. C. J. Deeks
 Pipe bending machine P. J. Connors
 Placket closer. Dress A. W. Shank
 Planer or jointer guard J. M. Jones
 Planter and fertilizer distributor. Seed C. E. Littlefield
 Planter. Potato J. R. Steitz
 Plastic material mold E. H. McClintock
 Plow. Wheeled A. E. Frenier
 Pneumatic drill A. C. Murphy
 Pneumatic drill P. H. Murphy
 Polishing machine D. F. Auburn
 Portable mold W. L. Hart
 Powder manufacturing apparatus. Smokeless G. W. Gentien
 Power mechanism E. C. Hodges
 Power transmitter F. Muller
 Power transmitting mechanism. Variable speed R. Cole
 Pressure regulator J. A. Schultz, Jr
 Printing device J. S. Duncan
 Printing press. Flat bed web H. F. Bechman
 Projectile. Anchor E. Mirgas
 Propeller. Sectional E. Humphrey et al
 Propelling and steering vessels. Means for A. L. Crosby
 Pump J. Bergstrom et al
 Pump F. L. Luthcum
 Pump H. Cline
 Pump J. P. Lavigne
 Pump. Air G. H. Schuhal et al
 Pump. Oil can P. H. Corns
 Pumping machinery C. L. Heister
 Puzzle. Railway H. G. Webster
 Rack C. F. Hoffman
 Rack or holder A. Lee
 Rail bond punch W. R. Condon
 Rail brake. Emergency clamp E. S. Peterson et al
 Rail fastening A. W. Avery
 Rail joint S. W. Bowser
 Rail joint J. D. Jones
 Rail. Track H. Laughlin, Jr et al
 Railway brake C. Furman
 Railway semaphore signal H. M. Abernethy
 Railway signal. Automatic R. E. Dial
 Railway switch J. M. Powell
 Railway switch. Automatic O. L. Lance
 Railway switch operating and signaling system A. G. Wilson
 Railway switching system W. Macomber
 Railway track equipment W. L. Clement
 Railway vehicle brake C. C. W. Simpson
 Railway vehicle coupling. Automatic L. M. Orosz
 Railways. Third rail cover for electric W. F. Kemmer
 Range flue construction A. C. Terrell
 Ratchet bolt L. Heffer
 Ratchet clamp F. E. Walden
 Razor. Safety D. E. Goe
 Razor. Safety P. Beltrame et al
 Razor. Safety W. J. Moore
 Reaper platform folding device C. A. A. Rand
 Receptacle opener F. H. G. Morse
 Refrigerator M. J. Bunnell
 Refrigerator and filter. Combined J. Y. Arnot
 Rein holder G. Stockhill
 Reolator attachment L. G. Guggell
 Resetting mechanism. Auxiliary W. Langrill
 Roadway for vehicles Z. T. Sweeney
 Rolling mill practice T. S. Blair Jr
 Rope and bucket coupling W. F. Smith
 Rope holder C. H. Herbert
 Rotary engine B. A. Slade
 Rotary motor E. Towson
 Rotary motor F. L. Gregory
 Saddle iron G. M. Urie
 Saddle iron heater A. M. Clarke
 Safety pin W. Strayer
 Salt. Making A. F. McClain
 Sash. Window E. J. Orr
 Saw set J. F. Fox
 Saw sawge A. R. Wilson
 Sawing machine. Stump R. Webb
 Scale F. P. Dunn
 Scale. Railway track W. N. Gilbert
 Screen A. Bufe
 Screens. Rotary die machine for making slotted T. C. Walker Jr
 Seal. Bottle F. D. Schmitt
 Seal. Bottle K. C. Gillette
 Sea's. Applying bottle F. D. Schmitt
 Sealing metal receptacles for food. Device for hermetically G. Farquhar et al
 Separator J. F. Senter
 Sewing machine. Blindstitch D. Flanagan
 Sewing machine shuttle C. F. Zenzig
 Sewing machine shuttle and feeder. Driving mechanism H. Kicher
 Sewing machine stitch forming device R. L. Lyons
 Sewing machines. Oil guard for A. Heller et al
 Sewing machines. Rotary take up for J. Diehl
 Shade cutting device F. W. Hubbard et al
 Shade fixture. Window D. Rosenber et al
 Shade pull. Window C. A. Scheif
 Shade roller support A. Dunont
 Shaft coupling J. W. Albert
 Shaft oscillator C. E. Lord et al
 Shaping straightening machine. R. M. Correy
 Shaking machine J. M. Camp et al
 Sharoener. Cutter head knife H. B. Ross
 Shearing knife W. E. Nagle
 Shingling bracket S. T. Wootan
 Shingling gage for hatchets C. Volmer
 Ships. Safety float for R. Held
 Shirt P. Kraemer
 Shoe cleaning and blackening device C. C. Griner
 Shoe dauber R. E. Saffold
 Shoe dauber W. W. Payton
 Shutter fastener lock B. Albertson
 Shutter operating device. Window H. N. Lowerthal
 Sign G. L. Crabb
 Signaling mechanism W. A. Pearce
 Signaling system G. H. Bowen
 Sleigh runner H. J. Schneider et al
 Smoke consuming furnace F. Fisher
 Soldering machine. Can F. F. Hartlowe
 Sounds. Means for recording W. L. Stillwell
 Sono straining apparatus C. Latsch
 Spoke. Metal wheel C. Hart
 Sponges F. B. Comins
 Spot setting machine S. W. Reynolds
 Spray motor. Steam J. Loftus
 Spring jack mounting plate H. P. Hibbard
 Spring wheel for motor cars and other vehicles L. & I. Jackson
 Stacker. Hay R. S. & G. D. Lewis
 Stacker. Pneumatic straw T. N. Sellers
 Stamp J. P. O'Connor et al
 Stamp. Hard J. S. Sanerier
 Star finder J. T. Rogers et al
 Stay bolt. Flexible T. H. Mooney
 Steam or air engine. Oscillating C. Dave
 Steel tired wheel I. E. McCracken et al
 Steel with low carbon. High manganese R. A. Hadfield
 Stone picker G. L. Holliday et al
 Stove. Cooking F. Harper
 Stove. Gas E. Quack
 Stove or range base M. F. Allen
 Stove. Regenerative hot blast F. C. Roberts
 Stoves. Chimney valve for hot blast W. F. Rust
 Stovepipe joint W. S. Bickel
 Stretcher, couch, hammock or chair. Portable H. J. Thomson
 Surgical needle T. C. Edwards
 Surveying instrument. Bore hole K. W. O. Schweder
 Switch and semaphore mechanism J. J. Gard
 Switch lock W. Anderson
 Switch stand W. Carter
 Switchboard support. Electric C. F. Warner
 Table H. H. Levy
 Table and rack for clothing. Combination W. H. Lowe
 Tables. Fastening device for C. Hepp
 Tacker. Hand A. W. Eaton
 Tag C. C. Blake
 Tag. Shipping W. N. Bragg
 Talking machine E. R. Johnson
 Talking machine records. Removing labels from C. S. Wickes
 Talking machines. Apparatus for removing labels from records for C. S. Wickes
 Tap grinding machine O. M. Mowat
 Tap register. Beer N. Horon
 Tapping machines. By pass and waste for H. Mueller
 Tape line anchor C. J. Reller
 Telegraph apparatus V. C. Baiding
 Telegraph transmitter. Keyboard R. Walters
 Telephone apparatus W. Kaitling
 Telephone system F. B. Cook et al
 Telescope. Gun sight E. Donitz
 Thawing point J. H. Lamley
 Thermostatic apparatus E. F. Woodman
 Thill coupling R. Eccles
 Ticket. Transfer J. T. Peck
 Thill coupling G. H. Hutton
 Tickets, checks, &c. Holder for M. Macdonald
 Tie plate W. L. De Remer
 Tie O. M. Du Bran
 Timing device H. B. McIntire
 Tire. Automobile F. D. G. Cook
 Tire. Automobile C. F. Obrecht
 Tire clip. Pneumatic E. C. Shaw
 Tire for wheels. Spring A. R. Hubbard
 Tire. Pneumatic J. O. Thomson
 Tire. Sectional pneumatic C. P. Mains
 Tire. Vehicle wheel T. F. Hamilton
 Toilet article L. Van Gale
 Toilet device A. K. Lovell
 Tongue R. Cederstrom
 Tongue depressor G. H. Hill
 Tongue scraper F. D. Lees
 Tonsillotomy E. E. Straw
 Tool. Pneumatic W. H. Keller
 Trace carrier O. B. Hitchcock et al
 Track fastening device L. H. Bowman
 Track sander G. Nugent
 Track sanding device A. A. Churchill
 Tramway switch M. C. Matthews
 Transit M. Munzer
 Transmission mechanism S. Linpert
 Transom lifter H. Osborne
 Tripod O. W. Steindorf
 Trolley pole controller A. L. Prentiss
 Trolley pole for conducting electric current to vehicles R. & I. Lindsay
 Trolley wheel C. F. Wilson
 Truck L. Kuykardall
 Truck. Railway J. M. Rohling
 Truck. Railway car H. H. Drew
 Truck. Self propelled vehicle R. Fuller
 Trunk leg attachment J. H. McNamara
 Tube expanding and beading tool W. McCormick
 Tubes. Apparatus for forming tapering J. Gribben
 Tag holder O. A. Rice
 Tuning slide for horns and like instruments H. B. Jay
 Turbine A. I. Cooper
 Turbine blade and vane J. S. Green
 Turbine. Elastic fluid F. Samuelson
 Turbine nozzle partition and nozzle C. A. Backstrom
 Turbine nozzle partition and running wheel C. A. Backstrom
 Turbine running wheel. 2 pats. C. A. Backstrom
 Type machines and the like. Gas governor for C. W. Seaward
 Type writer J. Volker
 Type writer and adder. Automatic key connecting means for a combined P. H. Turley

Type writer carriages. Auxiliary stop for... W. R. Fox
Type writer shifting mechanism... C. C. Christman
Type writing machine... W. F. Helmond
Type writing machine... H. J. Baile
Typograph... W. I. Ludlow
Umbrella mender... F. Stelter
Vacuum tubes. Automatic gas feed for... D. M. Moore
Valve... H. C. King
Valve... B. F. Siegrist
Valve... F. B. McMillin et al
Valve... A. D. McWhorter
Valve... H. S. Roberts
Valve. Automatic exhaust relief... C. A. Backstrom
Valve for air brake systems. Feed G. Wagner
Valve for locomotives. Safety... R. Anderson
Valve Gas... A. L. Hammarberg
Valve. Gate... F. C. Pfeil
Valve gear... J. Kolstram
Valve gear. Engine... A. L. Dorsey
Valve mechanism... F. Harper
Valve mechanism for engines... L. D. Lovelin
Valve mechanism for tanks and reservoirs... J. F. Senter
Valve operating mechanism... J. F. Senter
Valve. Reversing... P. H. Murphy
Valve. Single piece spring... M. A. Thiel
Valve. Steam feed... A. D. Catlin
Valve. Turbine nozzle... 2 pats. C. A. Backstrom
Valves and cocks. Means for hydraulically operating... W. J. McCarrill
Vehicles spring... C. Wesp
Valves spring. Pneumatic... G. W. Bell
Vehicle wheel... E. D. Woods
Vehicle wheel... C. A. Rittman
Vending machine... W. Mooney
Ventilator... J. F. Bowes
Ventilator... E. Stevick
Vermin exterminator... R. W. Townsend
Vibrator... H. M. Sciple
Vibrator. Mechanical... E. P. Ward et al
Violin. Composition of matter for improving the tone of a... L. Lawrence
Violin. Electric self playing... H. K. Sandell
Vise... C. Markmann
Voting machine... W. M. Cutler et al
Vulcanizing apparatus. Portable self contained... H. H. Frost
Wagon brake. Automatic... C. Garver
Wagon. Dumping... F. Aldrich
Wall mold... H. H. H. h
Washing machine... P. Cunneen
Washing machine motor... L. C. Lewis
Watch... A. A. O. Seeler
Watch holder... A. W. Funk
Watch movement box... J. H. Goss et al
Water circulating means... R. W. Nichols
Water closets. Valve support for outdoor... W. U. Griffiths
Water motor... A. Lang
Water wheel. Turbine... A. Giesler
Waterproofing compound... R. Falter
Weighing and assorting apparatus... H. Richardson
Whistle clip... D. H. Young
Winding and measuring device... S. E. Parikh
Windmill... C. D. Plympton
Windmill stoke adjuster... F. S. Laffin
Window cleaner... C. C. McCracken
Window frame for flexible curtains... F. J. Newman
Wire cables. Splicing... F. Seperak
Wire clamp... J. Bowers
Wire reel... M. J. Weirich
Wire rope cleaning apparatus... J. M. Wright
Wire uncoiling device... J. D. Bourne
Wire working machine... J. G. Smith
Wires or other cores with fibrous material. Apparatus used in covering... F. Hutchins
Woven fabric... W. M. Stevenson
Wracking appliance... E. Lovley
Wrench... G. H. Tatge
Wrench... F. H. Schall et al
Wrist protector... M. Moss
Writing machine... 2 pats. E. B. Hess

DESIGNS.

Ball. Rubber... J. Fisher
Brushes, mirrors or similar articles. Back for... L. C. Hiller
Dentist and barber chairs. Side frame for... J. Barber
Dish and similar article... G. L. Crowell, Jr
Display stand... A. P. Jackson
Glass dish... H. Richman
Match holder, ash tray and bell. Combined... G. C. Lynch
Pipe coupling or nipple... R. M. Thomas
Spoons, forks, or similar articles. Handle for... J. Clulee
Type for use in phonetic spelling. Font of... G. S. Jones
Vehicle body... F. K. & F. P. Stone

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MECHANICAL PATENTS.

Acid from formates. Producing concentrated formic... E. Franke
Adjusting box... G. W. & E. E. Edwards
Air brake... O. T. Beatty
Air signal, air brake and steam coupling. Automatic... H. C. Priebe
Amusement apparatus... A. S. Fitch
Anchor... W. McBride
Animal trap... R. E. Brown
Automobiles &c. Gear for... K. Schaeffer
Axle spindle turning machine... J. Johnson
Baking pan... T. Boyd
Baling press... E. May
Ball covers, &c. Seam for... D. M. Montgomery
Battery can or receptacle. Storage... T. A. Edison
Bed bottom. Spring... C. D. Brouette
Bed lounge... O. B. Starkwater
Bed spring. Piling... A. Lawrence
Bedstead... F. Krupp
Belt shifting mechanism... W. T. Stanfield
Binder for loose leaf ledgers... H. R. Moore
Binder. Loose leaf... 3 pats. J. L. McMillan
Binder. Temporary... F. R. Baker
Binding post... W. G. Winter
Blind fastener... I. Bradley
Blind or shade. Venetian... W. B. Hughes

Blotter. Ink... K. Gossweiler
Blotter or pad... L. S. Houghton
Boats. Life saving apparatus for submarine... O. A. C. Oehmler
Bobbin clutching device for spindles... H. E. Hughes
Boiler cover... M. Kamenstein
Bolt... H. H. Mudge
Bock carrier... F. Gottschalk
Bookcases. Adjustable support for sectional... F. W. Tobey
Boot and shoe. Waterproof... H. F. Karth
Bottle... D. J. Higginbotham
Bottle. Non refillable... G. Fraser
Bottle. Non refillable... L. S. Fenwick
Bottle. Non refillable... W. L. Schulz
Box fastener... W. Tisch
Bracelet joints. Manufacturing... C. Wriggins
Braid packet... C. L. Meyers
Brake mechanism... G. S. Blake
Breakwater... G. A. Wieland
Brickmaking machine... F. B. Rosback
Brickmaking plants. Filling mechanism for... F. Ziegler
Bridge construction... J. We fle
Brush attachment. Horse... C. I. Bush
Brush for cleaning horses reissue... J. F. Scanlan
Brush. Rotary... B. Kern, Jr
Brush. Water color... J. W. Hawkins
Bucket. Dredge... I. B. Hammond
Buckle... J. G. McNabb
Burglar alarm. Wireless... F. Keller
Burglar trap... O. W. Gabrielson
Buttonhole stitching machine... E. B. Allen
Buttons. Tool for placing shank... A. H. Cushman
Cabinet. Machine bearing... T. Kundiz et al
Calcium hydride. Producing... P. Askenasy et al
Can opener... F. G. Aschbrenner
Can opener... R. T. Stevenson
Cans. Testing filled and closed... E. S. Eno
Car door... R. J. Neville
Car door operating mechanism. Dump... J. R. Groves
Car replacer... J. M. Bowman
Car stop. Automatic... J. W. Reed
Cars. Load releasing mechanism for logging... L. W. Brown et al
Carburetor... A. J. Way
Carburetor... C. T. Galtier
Carriage. Collapsible baby... G. A. Svanberg
Carriage curtain fastener... A. E. Bernhardt
Cart and hog chute. Combined... B. F. Cleveland
Carton for nutmegs and the like... J. B. Fallon Jr
Catastrophic appliance... W. D. Berry
Cement block mold... C. E. Stokoe
Chain... H. T. Currie
Check or ticket issuing machine... A. E. Young et al
Cheese cutter... W. G. Clementon
Chain and butter worker. Combined... M. F. Stadtmuller
Cigar moistening box... W. Tisch
Clasp... A. Rosenthal
Clay products. Drying car for... W. R. Cunningham
Clock. Watchman's... R. Vogelmann
Clod fender adjuster... T. F. & L. C. McCarty
Clutch for automobiles and other purposes... M. H. Cormack
Clutch mechanism... W. J. Hagman
Cock. Self locking safety... W. F. Rabst et al
Coin separating, counting and packaging machine... C. F. Hess
Collar. Horse... S. H. Crum
Comb with adjustable ornaments. Lady's... A. Savastano
Combs. Machine for manufacturing celluloid... P. Durando
Compass handle adjusting device... O. G. Mayer
Compost and cotton seed distributor... W. B. Dukes et al
Compound brake... 3 pats. J. Dillon
Compound engine... W. E. Symons
Concrete block mold... J. R. Courter
Concrete silos. Mold for making solid... W. H. Limberg
Confectionery machine... A. S. Jacolucci
Confections. Machine for immersing the cores or centers of... L. N. Hartog
Contact chamber... W. C. Ferguson
Conveyer idler. Belt... F. F. Waechter
Conveyer. Traveling... I. H. Venn
Conveying system... A. C. McCord
Cooking apparatus. Heating device for camp... K. Hofmann
Cooking apparatus. Steam... B. J. Hendriks
Cooking utensil... S. Fine
Corer. Fruit and vegetable... J. Baker
Corn husking machine... W. B. Metcalf
Countersinking and counterboring attachment. Combined... J. H. Henry
Covering... M. E. Woods
Crane. Overhead traveling... E. E. Brosius
Cream separator. Centrifugal... E. A. Frosberg
Crows arm for towers... L. W. Noyes
Crushing and grinding mill... T. L. & T. J. Sturtevant
Cultivator... F. E. Davis
Cultivator... H. E. Klue
Current. Redressing and regulating device to transform a single phase into a continuous... L. R. Auvert et al
Currents. Apparatus for generating high frequency alternating... M. Leblanc
Currents. Apparatus for transforming continuous... M. Leblanc
Currents. Generating high frequency alternating... M. Leblanc
Currycomb... R. F. Lawson
Cuspidor... F. W. Kendall
Cuspidor cleaner and lifter... H. H. Jackson
Cut off Water... G. Herkel
Cutting tool... S. V. Huber
Dental plate swane... G. E. Freeborn
Dental tray... J. A. Henning
Desk... J. L. Rhodes
Dial rim... F. R. Cunningham
Display cabinet... E. A. Wilcox
Display holder... F. Prutton
Door check... J. A. Reed
Door hanger... L. A. Hoerr
Door lock. Corridor... H. G. Voigt
Door locks and latches. Adjustable frame for... J. Hope, Jr
Door operating apparatus... P. R. Forman
Doors and other objects. Roller support for movable... D. E. Hunter
Draft and buffing apparatus... S. P. Bush

Draft device... D. W. Stapp
Drill bit holder... U. S. Booth
Drill press stop mechanism... S. C. Schauer
Drill press. Suspended... J. H. & J. H. Birch
Drill support. Adjustable... A. Mohrbacher
Drilling machine. Automatic... L. E. Rice
Ear ornaments. Attachment for holding... C. H. Patten
Electric cables. Terminal box for... S. P. Grace et al
Electric current generator. Alternating... W. Hallock
Electric currents. Regulating resistance for... P. Wobber
Electric distribution systems. Ground and fault detector for... P. Torchio et al
Electric fixture. Pendant... W. L. Bradshaw
Electric heater... E. Thomson
Electric heater... J. A. Keardon
Electric light regulating attachment... C. Smith
Electric light switch... H. R. Coffey
Electric machine. Dynamo... J. R. Weszelinovits
Electric machine or electric motor. Dynamo... K. Lundell
Electric masts. Support for crown or antenna wires for... A. E. Brown
Electric snap switch... W. S. Mayer
Electric switch... W. S. Mayer
Elevator alarm bell... A. C. Sisson
Elevator shaft door. Chain attaching bracket for... J. Rashkin
End gate... A. G. Quinn
Engine vaporizer. Gas... J. V. Rice, Jr
Engines. Circuit breaker for gas... F. B. Packwood
Exercising apparatus... J. J. Cooper
Exhibitor. Merchandise... S. Goldberg
Fabrics. Device for restoring nap to... G. B. Dexter
Fabrics. Machine for cutting ribbed... F. W. Robinson
Felly for vehicle wheels... W. S. Plummer
Fiber, etc. Machine for decorticating Manila... C. E. Dailey
Fifth wheel... J. A. Grasberger
File, temporary blinder, loose leaf book, and the like... J. Walker, Jr
Filter... A. D. De Land
Filter... W. T. Janney et al
Fire escape... R. Barth
Fire escape ladder. Portable window... D. N. E. Campbell
Fire extinguisher. Chemical... J. B. Thomas
Fire extinguishers. Protecting device for chemical... R. Graf
Fireproof construction mold... W. S. Hindman et al
Flour bin... G. Kraus
Flush switch... B. Hubbell
Flying machine... F. E. Feits
Food product and making the same... F. H. L. Clarke
Fruit picker... O. E. Lindfors
Fuel. Apparatus for making artificial... J. J. Sheddock
Fuel brquets. Preparing... H. W. Jordan
Furnace... A. W. & F. W. Mach et
Furnace charging apparatus. Blast... C. H. Sample
Furnace draft device... J. T. Mazy
Furnace top... C. H. Clark
Furnaces. Heating bar for electric... A. L. Brougham
Game device... F. W. Moseley
Garbage reduction. Evaporator and extractor for... F. G. Wiseloge
Garments. Necking... G. Scott
Gas and gasoline engine... P. Furst
Gas burner. Inverted incandescent... A. S. Francis
Gas engine... B. F. Stewart
Gas jets and their extinction after a predetermined time. Apparatus for automatic lighting of... F. Testor
Gas, oil, and like engine... C. B. Redrup
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Gate... J. F. McNeill
Gear. Change speed and reversing... J. R. Parant
Gear for motor vehicles. Change speed... G. Cornilleau et al
Gear tooth. Antifriction... E. T. Alber
Gearing... F. Pilain
Glass structure... S. I. Feinberg
Grain bin ventilator, grain sampler, and weevil exterminator... J. N. McNeas
Grain cleaning apparatus... J. B. Holgate et al
Grate shaking... 2 pats. A. B. Willoughby
Grate system. Traveling... J. E. Bell
Gun sight... H. M. Cremer
Guns. Feed mechanism for automatic magazine... H. Lehmann
Hair retaining device... M. L. Ragley
Hammer... W. H. Parker, Jr
Harness hook... J. H. Hittle
Harvester. Sugar cane... J. D. Ehrlich et al
Hat. Collapsible... E. Ehringer
Hat fastener... E. Habbema Horak
Hat or cap... L. Rosenbaum
Hat pins and the like. Head for... W. J. Kittel
Hay fork. Horse... J. M. Boyd
Hay rake... D. F. Anderson
Head rest. Sanitary... N. Breckenridge
Headlight... A. Miesse
Heat conductor... W. Schoneleber
Heating apparatus... J. Heismann
Heating furnace... J. Hughes
Horizontally rifled pipe... J. D. Isaac et al
Hinge... H. E. Hoke
Hinge plate for tilting posts... L. B. Needham
Hoisting mechanism safety appliance... W. F. Bach
Hollow articles. Means for drawing... K. Gossweiler
Hook eye. Garment... C. W. Stevens, Jr
Hooping machine. Barrel... E. F. Bengler
Hop picker... E. C. Horst et al
Horse detach... G. A. Waters
Horse releaser... A. McLean
Horse shoe... J. E. Grogan
Hose supporter... H. B. Moses
Hub... J. C. Redemer
Hub for vehicles. Pneumatic... G. Middleton
Hydraulic motor... W. R. Tuttle
Hydrocarbons. Emulsifying and solidification of... W. Van der Heyden
Index. Card... J. E. Ralph
Internal combustion engine... W. Morey, Jr

Induction coils. Contact breaker for... F. B. Griffin
Ink pigments. Production of printing... P. Fireman
Ironing table... W. H. Tichborne
Joining machine... P. J. Joekken
Journal box cover... H. H. Kryger
Junction box... E. Greenfield
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Kinematograph projection apparatus. Arrangements for the centering of the images in... E. A. Ivatts
Knife handle... C. D. Harrington
Knob attachment for covers... E. J. Weston, Jr
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Ladder. Metal step... R. H. Fetta
Lamp. Carbureting... G. H. Holgate
Lamp protector... G. A. Russell
Lamp regulator. Electric... E. Johnson
Lamps. Adjustable support for signal... A. H. Hardlan, Jr
Last... F. J. Shalusey, Sr
Last... E. A. Eastman
Lath. Gate... E. F. Campbell
Laundry marking machine... 2 pats. T. L. Taylor
Leather. Hardening... D. Bryan
Lifting jack... C. W. Booth et al
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Liquids and gases. Automatic flow regulator for... J. H. Gregory, et al
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Lock... C. P. Nixholm
Lock... C. Calicchio
Lock center... W. R. Corbin
Locket, &c... S. Woods
Log loader... J. R. McGiffert
Loom shuttle... J. L. Poalk
Looms, warping machines, and the like. Lease rod for... T. A. B. Carver
Lubricating valves. Means for... J. A. Hicks
Mail box... H. Geddes
Mail receiver... N. K. Bowman
Manifolding device... J. E. Norman
Match box. Pocket... M. Gasbasio
Mattress... E. D. H. Lambotte
Measuring apparatus. Liquid... E. O. Litton
Measuring tool... W. Thain
Meat tenderer... J. W. Hurley
Mechanical drier... W. M. Cummer
Mechanical movement... A. Lindsey et al
Medicine from carrots. Obtaining... E. F. Bolt
Metal fusing apparatus... A. E. Menne
Metal splicing device. Expanded A. W. Rush
Metal working machines. Speed box for... E. J. Harnum
Metals. Electrolytically refining... A. G. Betts
Milk or cream storage and cooling vat... Z. S. Lawrence
Mines. Safety mechanism for hoisting or hauling apparatus for... R. Jensen
Miter box... M. J. Goodale
Miter box and cramp. Combined... H. Hill et al
Molding machine... H. E. Hcdgen et al
Motor control... F. Eickberg
Motor controlling apparatus. Automatic... F. W. Newell
Multiple feed lubricator... C. A. Anderson et al
Multicorductor... A. F. & W. Shore
Music rest. Portable... M. Waldenfel
Musical instrument. Self playing... H. M. Salyer
Musical instruments. Action for stringed... L. F. Boyd
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Nest. Hen's... S. C. Stevens
Nut lock... S. Barber
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Nut lock... C. Kemmerer
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Oil can... W. E. Harmon et al
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Oven grate. Baker's... J. A. Stackhouse
Ovens. Heat regulator for... J. P. Farmer
Package. Banana... W. Bell
Packing. Metallic... E. M. Cook
Paper bag manufacturing device... T. Hago
Paper clip... C. Spiro
Paper trimming machine... C. E. Whitmarsh
Paper vessels. Press for forming internal groove in... A. R. Tiffauy
Pasting machine... J. H. Trismen
Photograph horn support... L. P. Halladay
Photometer... T. Torda
Piano actions. Hammer supporting flange for... R. J. Murray
Piano. Automatic... H. M. Salyer
Piano pedal... L. W. Forcross
Picker stick check... N. Vallat court
Pigs' feet. Machine for splitting... J. Canning
Pile cutting machines. Rotary cutter shaft for... T. Morton
Pipe couplings. Gasket for... T. Pendergast
Pipes. Strainer support for water... W. S. Foster
Plaiting gage... P. Schoen
Planes. Gage attachment for... N. N. Beasley
Plow... I. Rivara
Plow riding attachment... E. Walbaum
Plow. Straddle or gang... R. C. Henderson
Plow. Virgin ground... J. H. Tripp
Plug. Flush attachment... H. Hubbell
Pool table... H. L. Haskell
Posts. Pattern for ornamental... E. Ne'scu
Pot cleaner... E. C. Lewis
Potato digger. Hand... F. R. Lancaster
Pounder washer... R. Hayes
Powder box. Tooth... W. H. Perkins
Power transmission mechanism... F. Sedivy
Preserving apparatus... W. G. Holden
Pressure gage... J. R. Goehring
Printing device... J. S. Duncan
Printing or like machines. Paper feeding machine for... F. W. Vickery
Printing plate and preparing the same... M. A. McKee
Printing press... G. R. Cornwall
Printing press mechanism... E. B. Woodward
Pruning implement... D. W. & D. A. Watson
Pulley... 2 pats. G. Richards
Pulley. Belt... 2 pats. G. Richards
Pulley casing or housing... C. A. Brinley
Pulverizer, lister and marker. Soil... J. W. Dalrymple

Pumping apparatus G. J. Murdock
Pumps Speed regulator for W. W. Satterthwaite
Rail and other like joint C. A. A. Chenu
Rail. Permanent way H. W. Perry
Rail tie C. W. Israel
Railway block signal system H. G. Comstock
Railway cattle guard H. B. Myers
Railway signaling system F. V. Black
Railway systems. Automatic contact mechanism F. Hedley et al
Railway systems. Automatic interlocking contact mechanism for electric F. Hedley et al
Railway tie A. S. Reavis
Railway tie. Metallic J. L. Gourley
Railway tie. Metallic P. M. Canty et al
Railway track clamp S. McElfarlick
Razor J. Green
Razor blade holder. Safety M. D. Fletcher
Register C. Schillinger
Retort charging machine L. W. Kirk
Retort cover. Automatic J. J. Barr
Rheostat. Starting W. C. Yates
Rifle or shotgun E. O. Johnson
Rolling mill feed table .. 2 pats. S. V. Huber
Rolling pin C. L. Sanford
Rotary engine T. K. Egan
Sash fastener A. O. Baker
Saw tool W. Bryson
Scale M. M. Schwarz
Scraper T. Booth
Scraper J. E. Culver
Screw press for molding tablets H. Endemann
Seam for nailing materials J. C. Ivory
Seat spring C. M. Haeske
Seed distributor F. R. Packham
Seed separator W. Meyer
Sewed fabrics. Producing B. H. Zimmerman
Sewing machine W. Jasper
Sewing machine W. T. Lintner et al
Sewing machine C. McNeil et al
Sewing machine bearing S. S. Reser
Sewing machine presser foot E. T. Allan
Sewing machine trimmer J. D. Schoonmaker
Shaft hanger J. A. Manahan
Sheet fastener. Loose F. P. Harris
Shelf bracket. Self locking H. Thomas
Shelves. Anti-ost motion device for pull out L. Day
Ships. Device for transporting E. C. West et al
Shoe. Pole climbing C. F. & C. Y. Yonagquist
Shoe tree or stretcher. Adjustable J. S. Hansen
Signal light apparatus G. Dalen
Siphon. Pural alternating S. W. Miller
Sleeping bag H. W. Wilson
Slider. Meat F. P. Burkhardt
Sm. k. and cinder conductor H. L. Larisey
Soap hook G. M. Hubbard
Sound producing device W. C. Smith
Speed changing device R. C. Osburn
Speed changing device R. K. LeBlond et al
Speed changing mechanism E. A. Muller
Speed changing mechanism G. D. Mueser
Speed transmission. Variable R. E. Lincoln
Spinning and twisting rings. Ring holder for G. L. Pierce
Spinning or twisting apparatus. Rotary ring J. T. Meats et al
Spray nozzle. Atomizing A. Franchetti
Stamp affixing machine G. O. Thompson
Steam boiler W. Thompson
Steam boiler. Oil burning T. W. Heintzelman et al
Stereoscope H. E. Richmond
Stock feeder W. H. Waldron
Stoker. Traveling grate J. E. Bell
Stove mold. Artificial F. Nelson
Stovepipe thimble and flue stopper D. Harding
Street sweeping machine G. P. Mum
Stud Soap fastener H. Kerugood
Stuffing box J. Halterman
Superheater boiler 3 pats. J. E. Bell
Sweep rake F. Nelson
Swing. Adjustable C. F. Bean
Switch operating device L. Z. Preston
Switch stand M. W. Long et al
Switch stand 2 pats. M. W. Long
Talking machine sound box M. A. Possons
Telegraphy. Receiving apparatus for wireless L. Arnsen
Telephone lineman's grabseat C. Randall
Telephone system L. B. Niemann
Telephone. Wireless F. J. McCarty
Telephony. Multiplex M. LeBlanc
Temperature regulator F. B. Kemmler
Testing tube C. Wagner
Thermometer J. L. Nix
Thill coupling J. M. Bryant
Thill coupling J. F. Galvin
Threshing machine A. T. Bakken
Time recorder D. A. Stowell
Tire guard C. R. Sanders
Tire. Ball bearing tube for W. Hogben
Tires. Machine for filling fabric for W. R. Smith
Tongue. Vehicle J. L. Hecht
Tool G. Libbeck
Tool Combination J. A. Hendrickson
Tool holding device E. A. Muller
Tool. Household G. Ulett
Toy F. J. McCormack
Toy M. Perez
Toy J. R. Patterson
Toy. Explosive M. Armstrong et al
Trace shield J. E. Martin
Track spreading signal J. M. Bond
Traction engine L. Y. Keibler
Traction engine A. S. Wyson
Tramway and other points and the like. Means or device for operating 2 pats. J. R. Peacock
Transformer. Electrical J. D. Hillard
Trolley catcher W. S. Roath
Trolley retriever C. I. Earll
Truck Boiler W. T. Fiers et al
Truck brake E. H. Slaybaugh
Truck. Conveyor A. Marvin
Trunk R. L. Turman
Trunk rope fastener E. W. Carroll et al
Trunk strap fastener H. J. Patterson
Trunk. Wardrobe A. D. Seaman
Tube emptying device. Collapsible A. H. W. Weber
Tube manufacturing apparatus S. V. Huber
Tuning instrument C. P. Dolan

Turbine J. Gersant et al
Turbine Reversible J. Molas
Type metal melting pot H. F. Bechman
Type writing machine E. F. Kunath
Umbrella D. Celenza et al
Valve H. S. Rankin
Valve. Dry pipe J. C. Meloon
Valve. Dry pipe J. R. Hamilton
Valve for engines. Cut off W. Goodwin
Valve for explosive engines G. W. Irwin
Valve. Globe, angle and check T. Waltz
Valve mechanism for explosive engines G. M. Beard
Valves. Means for operating pneumatic W. Lintner
Vault Burial T. E. Malone
Vegetable matter. Protecting A. Koy
Vehicle. Ammunition W. Mayer
Vehicle brake Motor G. Enrico
Vehicle Motor L. C. Lull
Vehicle spring F. E. Pratt
Veh. cleaving C. Burgess, Jr
Vehicle steering gear. Motor W. E. Slater
Vehicle wheel J. R. Welch
Vehicle wheel F. J. Conant
Vehicle wheel F. Ephraim
Vehicle wheel D. Waid
Vehicle wheel and axle J. E. Murray
Vending machine C. E. Davison
Vending machine P. A. Robichon
Vessel J. McArdle
Vessels. Lines for T. R. Timby
Voicing machine F. Keiper
Wagon reach J. L. Hecht
Wagons. Drive mechanism for distributing R. S. Wells
Washing machine G. D. Burton
Washing machine W. C. Fawkes
Watch balance staff F. C. Smith
Watch guard L. L. Tirrell
Watch movements. Means for attaching dials to F. R. Cunningham
Water. Apparatus for feeding lime to F. B. Leopold et al
Water. Feeding lime to F. B. Leopold et al
Water gauge F. W. Leidecker
Water heater B. Havne
Water tube boiler 2 pats. J. E. Bell
Water wheel A. H. Perry
Weapon. Hand K. Gehrer
Weighing device. Automatic P. Edbauer
Weighing machine. Automatic O. C. Patton
Well screen G. W. Standcliff
Wheel for cycles, motor cars, carriages and other vehicles J. N. B. Moore
Whiffletree H. Selson
Whip F. H. Audley
Windlass attachment E. R. Burkhalter
Windmill J. Axelstrom
Window cleaning device H. E. Walter
Window swinging device G. H. Parker
Wire cloth reel K. Mahaffey
Wire. Machine for covering bundles of G. F. & G. M. Wright
Wire spring fabric A. G. Cameron
Wire stretcher D. R. Clark
Wire stretcher and splicer J. Sanders
Workage. F. M., R. W. & H. W. Chapman
Wrapping machine J. N. Jacobsen
Wrench E. H. Derby
Wrench E. H. Zinto
Wrench O. M. Hansford

DESIGNS.

Brooch pin 2 pats. H. W. Fishel
Cigar H. Ruden
Glass candlestick B. W. Jacobs
Glass tile D. C. Ripley
Jug or similar article J. Slater
Pincushion J. U. Barr
Spoon 2 pats. L. G. Blasier

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MECHANICAL PATENTS.

Acid. Methylene citryl salicylic R. Berendes et al
Acid. Salts of methylene citryl salicylic R. Berendes et al
Adding machine L. S. Munger
Addressing machine M. J. Wise et al
Advertising device R. B. Powers
Agitator L. M. Stern
Air brake system L. Tucker
Air brake system L. Tucker et al
Alarm device G. E. Rideout
Alloy and producing it F. M. Beckett
Amusement apparatus A. J. Dayton
Amusement apparatus J. H. & H. S. Porter
Amusement device J. P. Wetherill
Anchor J. E. Johannessen
Anchor. Land F. R. Parker
Animal trap M. J. Hill
Animal trap J. J. Nance
Anode A. J. Delove
Armature testing apparatus V. Patton
Ash separator H. M. Coats
Aspirator J. Boekel
Automobile ad car motor M. Cazin
Automobile driving gear R. S. McIntyre
Automobile frame E. Sanchez
Bag mobile speed changing mechanism F. J. Ziegler
Bag machine J. L. Lowe
Ball feeding mechanism W. C. Gilmore
Baudage receptacle. Antiseptic O. C. Schulz
Basin fixture G. W. Gauo
Basins and the like. Attachment for wash J. Treager
Battery F. A. Decker
Bearing. Engine W. B. Mason
Bed spring with metal. Machine for covering wooden rails for C. H. Gangehoff et al
Bedstead corner fastening C. Vallone
Bedstead lock E. H. Burrage
Beer service apparatus W. F. Stark
Beet thinner J. A. Long
Blast furnace, trap for furnace top construction S. E. Hitt et al
Block machine H. G. Grisler
Blocks. Manufacture of I. Lucas
Boat for ice breaking and other purposes C. Stangebye
Boiler cleaner L. M. Pettit
Boiler leveling device F. I. Cass
Boiler setting C. B. Risley
Boilers. Apparatus for blowing off, washing and recharging W. L. Miller
Boilers. Scumming and blow off for steam J. B. Barnes
Boilers. Soot cleaner for W. Eichelberger et al
Bolt cutter. Stay J. W. Faessler
Book. Balance W. E. Prudhomme
Boring tool J. H. Johnson
Bottle. Antireflectable H. Campbell
Bottle cap E. Goldstein
Bottle filling apparatus J. C. A. Riecke
Bottle. Mucilage C. E. Barrett
Bottle. Nonrefillable B. A. Chew
Bottle stopper electrical fitting and the like A. Walther
Bowl O. S. Atterholt
Bowling alley pin setting apparatus E. E. Heath
Bowling pin setting apparatus J. M. Stokes
Box covering machines. Cutting attachment for M. D. Knowlton
Boxes from pasteboard. Dies for forming J. Godfrey
Boxes from pasteboard. Making J. Godfrey
Brake and buffer F. Moller
Brake shoe J. D. Gallagher
Braking mechanism J. E. Schepher
Branch box A. F. Hills
Bread, meat and vegetable cutting machine C. J. Vann
Brewers' wort or the like. Apparatus for heating or boiling H. J. Worsma
Brick and tile cutting machines. Wire attachment for W. R. Cunningham
Brick kiln H. J. Williams
Brick molding machine T. C. Holt
Broom shield B. F. Garque
Bucket N. M. Heller
Buckle G. E. Rawson
Buckle. Cross line H. A. Bowyer
Buckle. Harness R. B. Centers
Buggy and the like. Baby M. Weinstein
Building construction E. McClure
Building. High J. Gernaert
Burial crypt W. I. Hood
Busts. Device for fastening heads to E. T. Palmenberg
Button. Emergency U. S. Alz
Buttonhole cutting machine S. Lewis
Calorimeter. Steam L. M. Ellison
Camera. Photographic L. Borsum
Can opener H. J. Cassard
Cans. Making sheet metal preserving J. G. Hodgson
Candy pulling machine C. Thibodeau
Car S. Otis
Car brace. Freight H. Heard et al
Car fender E. Sherwood
Car. Juvenile hand S. D. & H. T. Latty
Car replacer G. H. Sargent
Car seat F. H. Henry
Car. Slewing T. O. Abbott
Car. Tank J. M. Ames
Car ventilator F. Van Ness
Car ventilator F. N. Dillman
Card holder G. T. H. Willing
Carding engine. Traveling flat W. Ratten et al
Carpet stretcher V. O. White
Carriage. Folding A. J. Adams
Carton filling machine F. Sunderman
Cash register and attachment H. T. Watson
Casing head H. Anchu
Caster J. E. Norwood
Caster. Furniture J. M. Collins
Casting metal sheets. Apparatus for J. F. Miller
Cement. Apparatus for and method of molding hollow objects from J. M. Boyle
Cement. Apparatus for molding hollow objects from J. M. Boyle
Cement block machine T. D. & C. W. P. Brock
Cement bricks, blocks and the like. Machine for molding H. J. Hurd
Cement. Molding hollow objects from J. M. Boyle
Cement objects. Core for molding hollow J. M. Boyle
Chair fan attachment J. F. A. Probst
Chair seat. Reversible R. N. R. Petersen
Chairs, tables and the like. Machine for leveling A. Lyon
Change apparatus B. F. Beasley
Channeling machine W. Prellwitz
Channeling machines. Roller guide for W. Prellwitz
Check protector J. M. Griffin
Cheese cutter. Computing J. A. Shuts et al
Chemical reductions and producing metals and alloys. Effecting F. M. Rickett
Chuck J. A. Leland
Churn and butter worker. Combined O. Christensen et al
Churn operating means. Vibrating W. P. Coleman
Clear holder B. N. Philippi
Circuit breaker. Automatic time W. N. Martin et al
Circuit controller E. S. Masie et al
Circuit operating device L. G. Woolley
Clamp or grip H. Petersen
Clamp pin G. E. Burns
Cleaning device L. O. Howell
Cloth steaming apparatus E. Senkbell
Clothes dryer J. S. Bougher
Clothes drying reels. Lifting device for J. G. Wendling
Clothes hanger M. Crane
Clutch. Friction C. West-Kunz
Coal handling apparatus W. F. Klemp
Coal handling bridge C. S. Williamson
Coal tipples. Screen scraper for W. E. Thoenen
Coaster brake G. Zinter
Cock. Angle W. H. Woody et al
Cock. Gage W. H. Kriner
Cock index H. Mueller
Coffee making device C. S. Rogers
Coffee pot A. H. Stebbins
Coin separating or assorting machine W. W. Broga
Coin tray and till B. F. Brewster
Collar. Horse C. W. Campbell
Collar pad C. W. Campbell
Collar pin and necktie fastener G. A. Beldier
Colors. Manufacture of antimony L. Brunet
Combustion regulating apparatus T. D. Pitcher
Communion or encharistic device H. C. Allen
Commutator truing and dressing tool C. H. Frick

Composing, type-casting, and other machines. Record strip or controller for W. Bancroft
Composition of matter F. A. Lobert
Concrete beams and girders. Construction of reinforcing steel for reinforced G. Aus
Concrete construction. Reinforced C. P. Walter
Concrete mixing machine G. M. Peace
Concrete. Reinforcement for W. W. Conard
Concrete reinforcing bar A. V. Reynard, Jr
Condenser F. C. Roberts
Condenser apparatus I. S. Davis
Conveyor. Belt 2 pats. E. G. Thomas
Conveyers, &c. Carrying roll for belt R. W. Dull
Conveying apparatus B. C. & S. Crandall
Copies. Producing multiple and backed F. G. J. Post
Cork extractor R. B. Gluchrist
Corn popper 2 pats. G. B. & J. H. Young
Corset E. B. Adams
Cover. Receptacle T. D. McCall
Crane. Vertical charging C. L. Taylor
Crosstie J. S. Schaeffer
Cuff holder L. L. Mallard
Cylindrical interst J. J. Leykauf et al
Cylinder charging mechanism S. S. Knight
Curling iron. Electric I. Allen et al
Current machine. Alternating R. D. Mershon
Curtain fixture G. F. Livezey
Curtain pole J. A. Powell
Curtain rod ornament T. Newell
Curtain stretcher F. G. Hoffheins et al
Cutting tool W. D. Allen et al
Dampener controller. Automatic F. F. Miller
Delivery mechanism O. L. Rabe et al
Dental chair L. L. Mallard
Dipper mounting A. L. Barker
Directory. Telephone G. C. Odor
Display holder for rugs E. Brown
Display novelty R. L. Wells
Display stand E. E. Smith
Disinfecting apparatus M. L. Odra
Dock. Floating dry E. Gannell
Door fastener D. Wilde
Door fastener. Sliding R. Campbell
Door lock. Latch knob L. W. Woodburn
Door opener and closer D. Wilde
Door or gate opening and closing device R. B. Browne
Door. Revolving C. H. Roegner
Draft equalizer J. K. Woolcott
Drawing and other rolls. Machine for raising lines on G. A. Bates
Drawing board G. S. Manuel
Drawing kit L. Forsyth
Dredge moving apparatus W. H. Silver et al
Dress shield V. G. Alexander
Driers. Apparatus for maintaining uniform pressure in W. B. Mason
Drying furnace I. Caygill
Drill feed F. F. Smith
Drill press. Multiple W. C. Toon
Drilling machine J. S. Surbaugh
Dumping platform and elevator. Combined E. W. Harmon
Dye for lakes and making same. Monopazo O. Ernst et al
Dyeing, bleaching, and sizing cotton warps. Apparatus for J. Hartley
Dynamometer governor E. B. Jacobson
Electric brake E. Franke
Electric circuit controller M. Schuppe
Electric machine. Direct current dynamo E. C. Wright
Electric machine. Dynamo B. T. McCormick
Electric sparks. Apparatus for producing W. Marshall
Electrochemical apparatus F. A. Decker
Electrode. Storage battery T. A. Edison
Electrolytic cell A. O. Tate
Electrolytic work. Lining tanks for J. F. Miller
Electromedical appliance D. R. Overman
Electroplating apparatus D. F. Broderick
Elevator guide shoe B. Dorhoe
Elevator safety device F. E. Ackley
Engine F. Hennebohl
Engine J. M. Stadel
Engine cooling device E. B. Harshbarger
Engine reversing mechanism. Gas W. A. Hansen
Engine starter C. J. Coleman
Engine vaporizer. Explosive H. O. Westerdar
Engines. Beating roll for paper pulp or other H. Rennett
Excavating apparatus W. H. Haffron
Excavator W. R. Martin
Expansion tube O. S. Pedersen
Explosive F. E. W. Bowen
Explosive engine L. Iversen
Eyeguard. Flexible H. M. Tilleston
Eyeglasses or spectacles. Mounting for P. Moews
Eyelet varnishing machine I. W. Gies et al
Eyescopes H. D. Reese
Fabric L. W. Wertheim
Fans. Oscillating device for motor driven H. S. Brown
Farm rack. Combination H. M. Morrill et al
Fastener L. J. Franklin
Feeder. Automatic stock F. B. Platt
Felly. Wheel P. Patand
Fence post W. H. Ruffles
Fence post G. H. Kaufman
Fences. Concrete post and adjustable fastener for wire A. J. Taylor
Fiber cleaning machine 2 pats. J. Garcia
File H. Getaz
File for papers E. Stebbins
Filter J. Conveyer
Fire alarm boxes. Device for permitting the automatic operation of L. G. Woolley
Fire escape G. J. Pitts
Fire extinguishing apparatus. Hand A. G. Laurent
Firearms. Single trigger mechanism for G. H. & W. B. Parkin
Fireproof door or shutter W. S. Jackson
Fireproof door or shutter H. T. Higinbotham
Fishing bait. Artificial minnow J. M. Meredith, Jr
Flat iron heating oven J. G. Redford
Float J. Willmann

- Fluid pressure brake 2 pats. W. V. Turner et al
Folding rack for poultry, &c. P. H. Deis
Forge treating apparatus T. H. Mapp
Fruits and vegetables. Apparatus for removing the skins of C. D. Monte
Fuel economizer soot cleaner W. Eichelberger
Furnace J. F. Giroux
Furnace C. E. Garner
Furnace J. M. Heverly
Furnace construction F. E. Schachle
Furnace fire pot W. A. Hohenadel et al
Gage wheel A. W. Howell
Game apparatus W. S. Haynes
Game counter G. B. Risley
Garden implement C. S. Stevens
Garment hanger E. Mayer
Garment, Storm I. V. Benoit
Gas apparatus, Water J. M. Kusby
Gas burner, Natural H. M. Leys
Gas engine, Two cycle F. von Handorff
Gases. Apparatus for treating noxious A. C. Day
Gasket cutter G. T. Miller
Gate C. E. Rite
Gate C. J. Van Valkenberg
Gear adjusting mechanism A. J. Benton
Gear cutter framing H. E. & E. G. Eberhardt
Gear, Machine for making worm and spiral W. K. Liggett
Gear, Variable speed transmission P. F. Foley
Gearing, Changeable speed A. L. Muren
Gearing, Speed changing P. A. Bredsvold
Generating and carbureting apparatus D. Millor
Glass, Feed out device for molten J. H. Lubbers
Glass holder, Looking F. B. La May
Glass pressing and blowing machine G. W. Henning et al
Governor C. Andrews et al
Grain bag holder W. R. Mosher
Grain binders, Back wing support for C. Maui
Grain fender G. A. Dean et al
Grain separator W. Kuester
Grease cup reissue J. S. Powell
Grease cups, Device for filling E. S. Eid
Greenhouse bench R. O. King
Grinding mill A. M. Dellinger
Gun fire, Instrument for measuring and correcting errors of J. L. Latimer
Hammer, Pneumatic J. C. McCaveny
Hammock support W. H. Morehouse
Handling material, Device for T. B. Rice, Jr
Hanger R. W. Beaton
Harmonic horn R. J. Smith
Harness W. H. Sneed
Harness attachment B. A. Adams
Harrow J. E. Arnold
Hayvester (trimmer, cane) J. D. Cooper
Hat A. Mayer
Hat frame machine W. B. Foster
Hat guard L. Weaver, Jr
Hat pin W. Gaskell et al
Hat pin J. Thomas
Hay press J. Dain
Heating apparatus F. A. Deiph
Heating appliance, Domestic and industrial C. J. Roux
Heel, Spring A. F. Luzzi
Hinge for window screens E. F. Douglas
Hoisting machine D. Arthur
Holder M. H. Hart
Hollow vessels, Forming seamless metallic J. H. Gault
Hooks and eyes, Carrier plate for J. W. Granger
Horse boot 2 pats. J. Fennell
Hydraulic transmission device W. C. Schwarz
Hydrocarbon burner T. Muehlstein
Hydrocarbon burner system B. F. Jackson
Ice producing apparatus D. D. & P. J. Sprague
Index or directory H. S. Harde
Indicator W. A. Banister et al
Induction coil M. W. Brinkman
Injector S. L. Kneass
Injector, Hypodermic D. S. Reese
Internal combustion engine A. B. Goodspeed
Iron, Bending cast B. S. Cowies
Iron or steel, Treating F. M. Becket
Jail cell J. B. Smith
Jewel mounting A. A. Boismaure
Journal bearing and making same D. H. Stewart
Journal box S. H. Campbell
Journal box, Adjustable F. E. Buxton
Key or wedge, Tool head attaching C. H. Booth
Journal box lid J. S. Patten
Knee pad W. R., S. R., & W. H. Chambers
Knee protector I. D. Larsen
Knitting machine, Circular independent needle C. A. Santmyers
Ladder, Extension F. A. Bobbitt
Lamp O. S. Atterholt
Lamp and air carbureting apparatus therefor, Safety F. W. Suter et al
Lamp fitting, Electric J. Dugdill
Lath F. W. Merriweather
Lath boards, Machine for making H. R. Karstens
Lath, Plaster F. W. Farrington et al
Lathe F. J. Barnett
Laundry registering device T. O. Branch
Legging T. O. Branch
Leas grinding machine M. Rosenwasser
Leas grinding machine F. M. Clark
Letter sheet, Separable double M. A. Howe
Level and plumb, Combined W. A. Gibson
Level and triangle, Combination hand W. Thoburn
Level and triangle, Hand W. Thoburn
Level, Plumb F. M. McLeroy
Life lines, Means for projecting and anchoring A. Meyer et al
Lighting arrester J. V. E. Titus
Linotype machine R. M. Bedell
Liquid fuel burner E. D. Schmucker
Liquid fuel burning apparatus F. E. Nelson
Liquid separator, Centrifugal M. Decker et al
Liquid weighing or measuring machine F. O. Hagne
Liquids by compressed air, Method and apparatus for raising R. Stirling
Liquids electrolytically, Apparatus for treating A. O. Tate
Loading apparatus E. Rosenvall
Locomotive, Electromagnetic J. L. Potter
Log loader J. R. McGiffert
Log loader frame J. R. McGiffert
Loom harness motion C. H. Atkins
Loom, Jacquard S. Smith
Loom shuttle and bobbin tensioning means therefor C. H. Atkins
Loom warp let off mechanism C. H. Atkins
Loom warp stop motion, wire weaving C. H. Atkins
Loom, weft fork and slide F. D. Chesborough
Looms, Cloth take up mechanism for C. H. Atkins
Looms, Heddle for weaving J. Grob
Loop and stud connection J. H. Pilkington
Loose materials, Apparatus for reclaiming E. H. Messiter
Lunch box, Folding M. A. Guman
Mail matter, Pick up table for G. A. Gasman et al
Mailing and pneumatic drying apparatus, Pneumatic F. H. C. Mey
Manure implement W. J. Carroll
Marble working machine J. R. Pierce
Massage apparatus F. Schmitt
Match making machine H. B. Berg
Measuring and mixing machine A. Laiquist
Measuring electrical resistances, Apparatus for S. Avershed
Mechanical movement F. H. Richards
Mechanical movement F. J. Ziegler
Medical battery C. W. Taylor
Metal bending machine H. M. Smith
Metal, Rocker press for shaping C. A. & C. F. Murodock
Metal sheet wrapper H. E. Marks
Metals, Apparatus for electrolytic deposition of H. C. Harrison et al
Meter W. J. Mowbray
Micrometer gage G. Koh haas
Mining drill post, Coal P. Kummel
Mirror, Hand J. Komorous
Mirror support F. N. Coffman
Molding machine F. W. Hall
Monolithic hollow objects, Apparatus for and method of continuously making M. Boye
Monolithic hollow objects, Apparatus for continuously making J. M. Boye
Monolithic hollow objects, Means and method for continuously making tubelined J. M. Boye
Monolithic objects, Apparatus for continuously making J. M. Boye
Mop wringer J. D. Carter
Motor control apparatus G. W. Eaker
Motors and other vehicles, Means for prevention of skidding or side slipping of H. Turner
Motors, Fuel feeding device for internal combustion H. J. & T. E. Podlesak
Motors, Means for automatically timing the spark for producing ignition in explosion A. E. Billie
Motors or the like, Apparatus for automatically starting explosive L. A. C. Letombe
Music leaf turner J. O'Connor
Musical chord indicator C. A. Miner
Necktie fastener clasp F. E. Wicking
Needle holder L. C. McNeal
Nesting and brooding box J. W. Bradford
Newspaper holder J. J. Dellwyler
Nickel contained in basic nickel precipitates, Recovering the H. H. Dow et al
Nose guard W. H. Keisner
Numbering and dating machine E. G. Bates
Numbering machine, Hand H. P. Hamburg
Nut lock W. Aikins
Nut lock J. B. Puri
Nut lock R. D. Baker
Nut lock J. J. Potter
Nut lock H. C. Werner
Nut lock A. J. Logan
Nut, Lock A. W. Carson
Ore sifter P. H. Craven
Organ pipe F. I. White
Ornaments, Machine for inserting T. L. Sherman
Oven, Baked C. W. Heiler
Oven door F. J. Albrecht
Oven, Rotary baking F. R. Barnheisel
Ovens, Combined heating and steam-feeding mechanism for rotary bake F. R. Barnheisel
Overshoe S. Schwarzhild
Package carrier J. W. Clark
Package for implements A. W. Stephens
Packing, Metallic H. Thompson
Packing, Rod W. Sudekum
Padlock, Permutation H. Handler
Paper bag machine E. C. Westervelt
Paper boxes, Making E. H. Taylor
Paper coating machine M. Cantine
Paper fastener, Metallic G. W. McGill
Paper hanger's tool W. U. Colthar
Paper marbling machine J. W. Newbery et al
Parasol top W. H. Perkins
Paring machine, Fruit D. F. Hunt
Pea shelling machine A. S. Adam
Peat, &c., into blocks or cakes, Machine for forming and compressing M. C. Sharpneck
Peat machine, 2 pats. M. C. Sharpneck
Pebble mill lining M. F. Abbe
Peeling of fruits and vegetables C. D. Monte
Pen and pencil clip J. H. Pilkington
Pen, Drawing W. B. Phillips
Pencil sharpener F. E. V. Baines
Perforator, Loose leaf L. M. Holden
Phonograph attachment C. L. Mordm
Photographs with any desired background, Production of F. J. Discher
Photographic focal plane shutter L. Borsum
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Picture projecting machine, Life motion O. T. Weiser
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Pie connection H. Mueller
Pipe couplings, Clamping ring for J. Clark
Pipe cutter C. Wahnsiedler
Pipe joint J. P. Putnam
Pipe wrench G. Nicholson
Pipes, &c., Magnetic drawing apparatus for G. Baehr et al
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Planter M. E. Fidler et al
Planter, Corn R. S. Carr
Planting machine B. C. McCoy
Plate lifter A. E. Phillips
Plastics, Gravity tamping and molding machine for A. J. Taylor et al
Plow G. Wiard
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Plow heel T. H. Hilley
Piling and receptacle, Fused J. C. Hatzel et al
Pole arm, Wrought metal M. E. Harrison
Post driver C. Bandimere
Power brake, Mechanical L. Pingst
Press releasing mechanism, Bundling J. F. Anderson
Pressure, Apparatus for maintaining uniform W. B. Mason
Primary battery C. E. Hite
Printers' chases and forms, Auxiliary support for J. F. Horn
Printing films, Lining B. Day
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Punching machine W. Fehr
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Refrigerator and water-cooler, Combined E. Keene
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Saw guide, Band J. J. Callahan
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Shoveling board D. Wilde
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Steering gear E. Huber
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Locket or similar article... F. W. Arnold
Medal... S. Freund-Balla
Sign. Display... S. J. Reckendorfer
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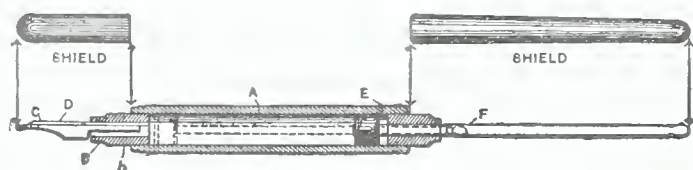
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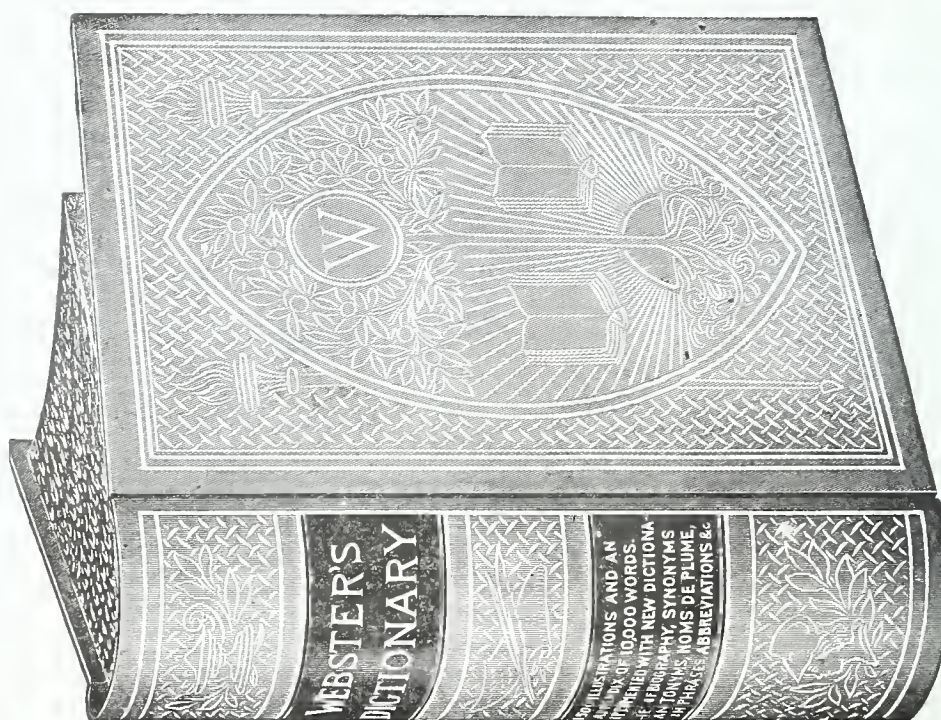
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NINETEENTH YEAR. }
No. 9.

WASHINGTON, D. C.—SEPTEMBER, 1907.

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ROTATING TOWER CRANE.

By L. RAMAKERS.

THERE has been recently installed in Dublin, Ireland, one of the most modern of electrical cranes. It has a capacity for carrying 100 tons, and is used on the docks for loading guns, boilers, machines, and other heavy articles. It can raise a load to the height of 100 feet, and swing 150 tons in a radius of 75 ft. When hoisting 20 tons, its speed is 20 feet per minute, and for 150 tons, 3 feet. Its rotary part (see Figure) consists of a vertical crane-post with a double-cross arm. The lower part of the crane-post rests on cylindrical bearing, and the upper horizontal pressure is borne by means of rollers on a bearing fixed to the trestle surrounding the crane-post. The gear for hoisting and for working the traveller is in the machine room, which, together with the counter-weight, is erected on the shorter cross arm. The traveller runs on the long cross-arm between the two main supports, which are connected to each other by a horizontal brace. This arrangement ensures greater rigidity of the sides than the usual construction. An auxiliary hoisting apparatus of 20 tons working capacity and 30 tons maximum carrying capacity is erected on the traveller. The slewing mechanism is arranged

on the upper platform at the junction of the crane-post and the cross-arm. The motor-house from which the crane is operated, by means of the controllers, is situated between the main

and to the platforms on the cross-arm, as well as to the motor house.

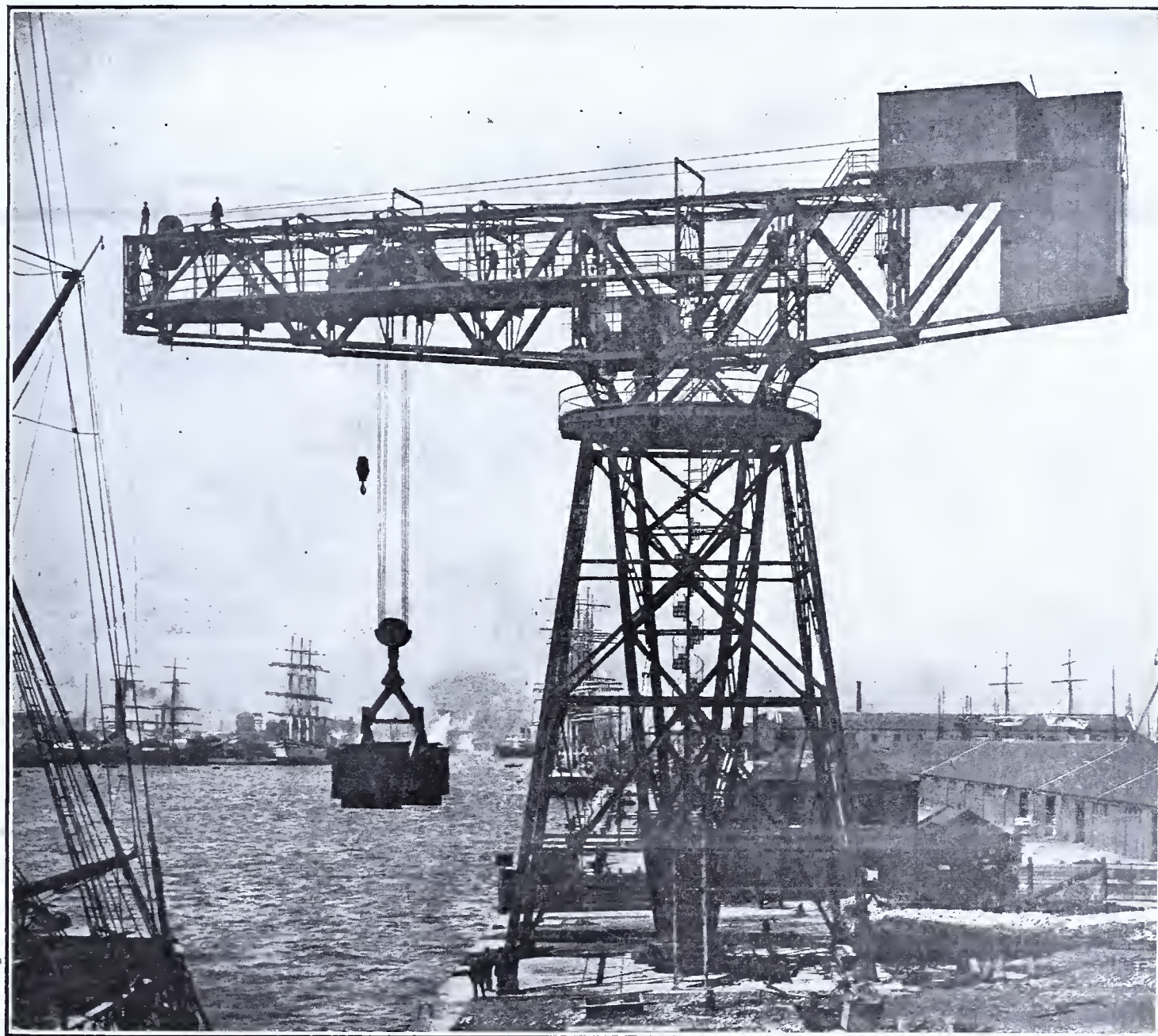
The electrical equipment is of the 900-volt continuous-current type, and the motors are specially designed for

revolutions per minute. The travelling motion motor is of 30 C. h. p. running at 790 revolutions, while the slewing motion is a 19 C. h. p. motor running at 570 revolutions.

The controllers are of the complete-reversing type, fitted with hand wheels, indicating the "off" position. The lifting controllers have a greater number of points of control on the lifting side than on the lowering side. The slewing and travelling controllers have the same number of points on each side.

The electrically-controlled brakes on each motion are series wound, and are designed to hold the loads should the current be accidentally interrupted.

The switch board is simple in design, and is fitted with one double-pole quick-brake main switch, and one single-pole maximum output for main lifting; one single-pole fuse and one single-pole maximum cut-out for auxiliary lifting; one single-pole fuse and one double-pole brake switch, for the travelling motion; one double-pole quick-brake



100-TON ROTATING TOWER CRANE.

supports of the cross-arm, near the center. From this spot the driver has a good view over the working field of the crane. Conveniently arranged staircases lead to the machine room,

crane work. The main-lifting motor is of 60 C. h. p., and running at 690 revolutions per minute. The auxiliary lifting motor (placed on the traveller itself) is of 40 C. h. p. and runs at 690

and two single-pole fuses, for the slewing motion. The collecting gear is of the standard type.

The supply of motors for crane work is a specialty of the manufacturers of

this apparatus (Messrs. Siemens Brothers of London) who have adopted a new system of rating based on their experience in such electric driving. A few words as to this rating will be of interest. It is, of course, clearly understood that with cranes, hoists, capstans, and other machinery of this class, the work demanded of the motor is of an intermittent nature. The actual size of the motor required for any particular motion of a crane depends entirely upon how intermittent this work may be. It is evident that the controlling factor is the ratio between the period during which the motor is giving out power, and the period for which it remains idle. In the case of the lifting motor of a jib crane transferring general cargo from ship to truck or vice versa, Messrs. Siemens Bros. find that this ratio, on the average, is about 1 to 8. That is to say, for every minute during which the motor is exerting its full power, there is a corresponding pause of seven minutes during which the motor is at rest. These figures are in the nature of an average taken over a whole day's work. It is evident, therefore, that a motor which will work under these conditions without overheating or sparking from the electrical point of view, is amply large enough for the work required; and such a motor should be selected from the column in the firm's motor tables headed "one-eighth load factor." For the convenience of sub-division, they have arbitrarily taken a period of 12 minutes as being the time taken for one complete cycle of operations: so that, upon this basis, a motor which was rated to give out its full power for $1\frac{1}{2}$ minutes and then allowed to rest for $10\frac{1}{2}$ minutes, would be working at a one-eighth load factor—that is, one-eighth of 12 minutes working, and seven-eighths of 12 minutes resting. The above period of 12 minutes can be varied within very wide limits without materially affecting the final result, the limit as to the maximum time of working depending on the size of machine. In crane work generally, the time for a complete cycle of operation is almost always considerably under 12 minutes, being more of the nature of a one or two minutes cycle. In some cases, however, of crane and other intermittent working, a motor may have to work at full load continuously for much longer periods than the limits of the load factor rating would permit. For instance, it is possible for a machine to have to work for two hours continuously and then rest for 14 hours, thus calling for a machine to work at apparently a one-eighth load factor: whereas another motor may have to work for $1\frac{1}{2}$ minutes continuously and rest $10\frac{1}{2}$, this also being a one-eighth load factor. It should be noted that the smaller sizes of motors attain their full heating limit much more quickly than the larger sizes, owing to the greater weight of material in the latter, and the rather higher efficiency. On the other hand, however, the radiating surface per watt lost is rather greater in the smaller motors than in the larger, and, therefore, although they

heat more quickly, they also cool down more quickly. It will be seen, therefore, that in selecting crane motors two factors must be considered—firstly, the intermittence of the load; secondly, the period for which the motor may be called upon to do its full work without stopping.

Regarding the rating at which the firm usually puts forward motors for crane work, (if the required speed is definitely known), it is fairly easy to calculate the load factor at which the motors will have to work. For instance, taking a jib crane lifting and slewing by separate motors, a complete cycle of operations would be as follows: adjusting and hitching on the load, raising the load, slewing, lowering the load, unhitching the load, raising the empty hook, slewing back, lowering the empty hook. As a matter of fact, raising and lowering the load and slewing are frequently performed together, but, as far as the motors are concerned, this is immaterial. By adding up the total periods of time during which the motors are called upon to give out their full load (making due allowance for the time they are raising the empty hook, etc.) and dividing the total time of a cycle by this figure, the load factor will be obtained. Lifting motors almost invariably have to work at lower load factors than slewing, as the latter are practically always working at full load while in operation. For lifting motors, the load factor may vary from about one-third for coaling cranes down to one twelfth, or less, for general merchandise cranes, and the slewing motors, respectively, one-half down to one-eighth. For shop and overhead travelling cranes, a one-sixth load factor for lifting and cross traversing, and one-fourth load factor for travelling, meets the conditions of average practice, and for capstans and winches, one sixth to one fourth load factor is a fair allowance. Only in very rare instances do conditions demand a higher rating than one-third.

Ship Cemented to a Rock.

A ship which was carrying a cargo of cement from Europe to San Francisco is reported to have struck a rock off the coast of Cornwall and remained fast with a large hole in her hull. A salvage crew arrived to take the boat from her position, but it was found that the water had caused the cement in the hold to set and it was firmly molded around the penetrating rock. The entire cargo is said now to be as hard as rock and hope of making further use of the ship has been abandoned.

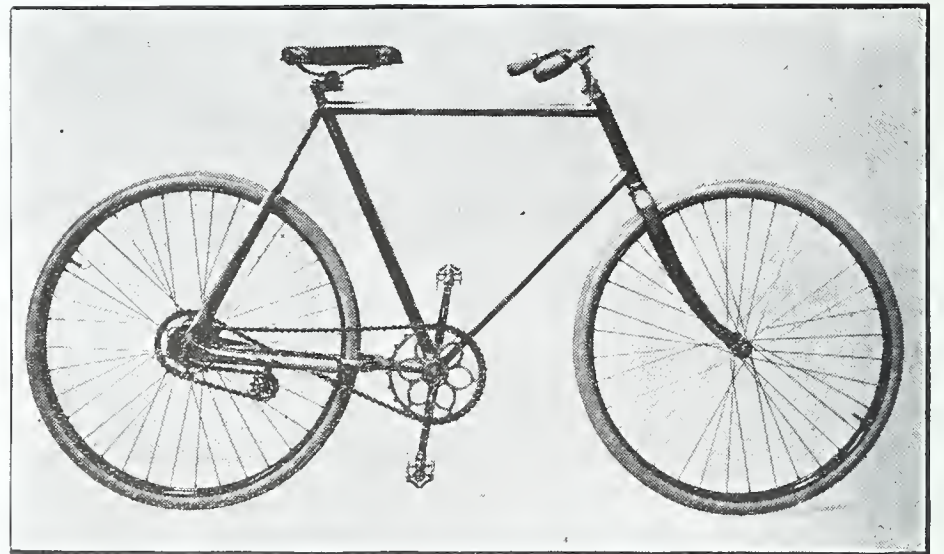
Seeing Smokeless Powder.

German military authorities are experimenting with a device by which the location of troops using smokeless powder may be easily discovered. By this device it is proposed to survey the landscape through pale red glasses. The flash of smokeless powder appears strong in red light, while ordinary objects are dimmed. By furnishing field glasses with the device in question, which is provided with screens of the proper tint, the position of concealed marksmen can be detected.

GEARLESS TWO-SPEED WHEEL.

THE machine illustrated herewith weighs but a few ounces more than an ordinary bicycle, and offers a solution of the problem of a wheel having two speeds and an automatic change gear, which is exceedingly simple and inexpensive.

The novelty lies in the fact that the chain runs over two sprockets instead of one and gives, without supplementary friction, one speed by pedaling the usual manner, and another by back pedaling. Thanks to a special arrangement of the pedal bracket, the



chain never pulls obliquely, but always directly, that is to say, parallel with the axis of the machine. Besides it is only one of the halves of the chain that works. In direct or forward pedaling, it is the upper half, and in back pedaling, the lower. All the rest of the chain is slack and runs idly as in an ordinary bicycle. The small wheel merely supports the chain and reverses its motion. It is, therefore, submitted to no strain; and, as it serves to regulate the tension of the chain, there is no need of two rear

stretchers, and the wheel is not apt to get out of order.

For changing the gear, it suffices to change the direction of pedaling; an operation that may be performed instantaneously and so easily that it is possible to pedal one revolution forward and one backward, that is to say, to change the gear at every instant without any interruption in the operation of the machine. If the rider stops pedaling, the chain and sprockets will remain immovable and the machine will come to a standstill. Notwithstanding the aversion that bicyclists have for back pedaling, the

makers of this machine, (the manufacturer Francaise d'Armes et Cycles of Saint Etienne, France,) taking as a basis the fact that back pedaling entirely abolishes the dead centre, completely utilizes the motor muscles, and gives greater efficiency than direct pedaling, has constructed this very interesting two-speed and free-wheel machine. The two speeds are obtained instantaneously, automatically, and while running with a single chain, without gearing or controlling mechanism.

Demand for College Graduates.

There has been more or less talk about the extent to which college graduates in the United States find ready employment in the large shops and manufacturing establishments almost immediately upon the completion of their college courses, and it is interesting to be able to confirm the correctness of this state of affairs at the present time. In a communication from the professor of mechanical engineering in one of the large technical colleges, the following statement will explain itself and form interesting reading for those who are interested in the relation of modern educational methods to practical life. This especial school is but an example of the experience in other engineering educational institutions, and this particular professor says: 'We will graduate fifty men this year, and a fine crowd of fellows. They are all placed except three or four, who want a special kind of work, and will get it. Three of them go to Schenectady, three to Westinghouse Electric, three to the United Gas Improvement Company, two to the Baldwin Locomotive Works, one each to Cramps, Southwark, Ambridge, American Locomotive Works,

two to the New York Telephone Company, etc.' No better evidence than the above report could be given as to the extent to which the modern engineering training of the technical schools is furnishing men immediately acceptable to employers, and the names of the works which thus take the graduates into their service give additional proof of the acceptability of the college graduate.—*Cassier's Magazine*.

Wheelbarrows With Sails.

The wooden wheelbarrow is in universal demand throughout China, and the annual demand for these unwieldy vehicles is so large that it would be impossible to make even an approximate estimate of the number sold. Not only are they the chief means of transporting commodities of all descriptions in the treaty ports, but they are used to a far greater extent in the interior, where it is necessary to transfer freight from river boats or Chinese junks to points overland practically inaccessible by any other mode of conveyance. Many of these wheelbarrows are supplied with sails, says the *Pathfinder*. If the Chinaman is going in the direction of the wind, he hoists his sail and has only to guide the wheelbarrow.

THE DOUGLAS MILK REFRIGERATING PLANT.

By E. OMMELAUGE.

THE great development of the dairy industry during these last years is due to the increasing use of refrigerating machinery in the countries which supply dairy products to the markets of the world. England, for instance, is receiving large quantities of butter and eggs, as well as poultry, game, fruit, etc., from her colonies, which would be quite impossible except by the aid of refrigerating machinery on board of the transporting steamers.

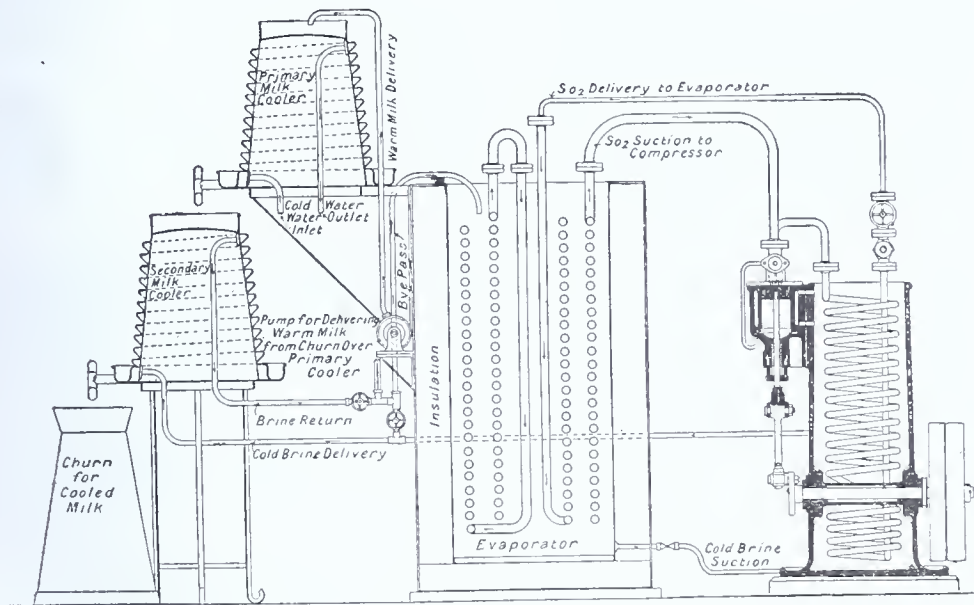
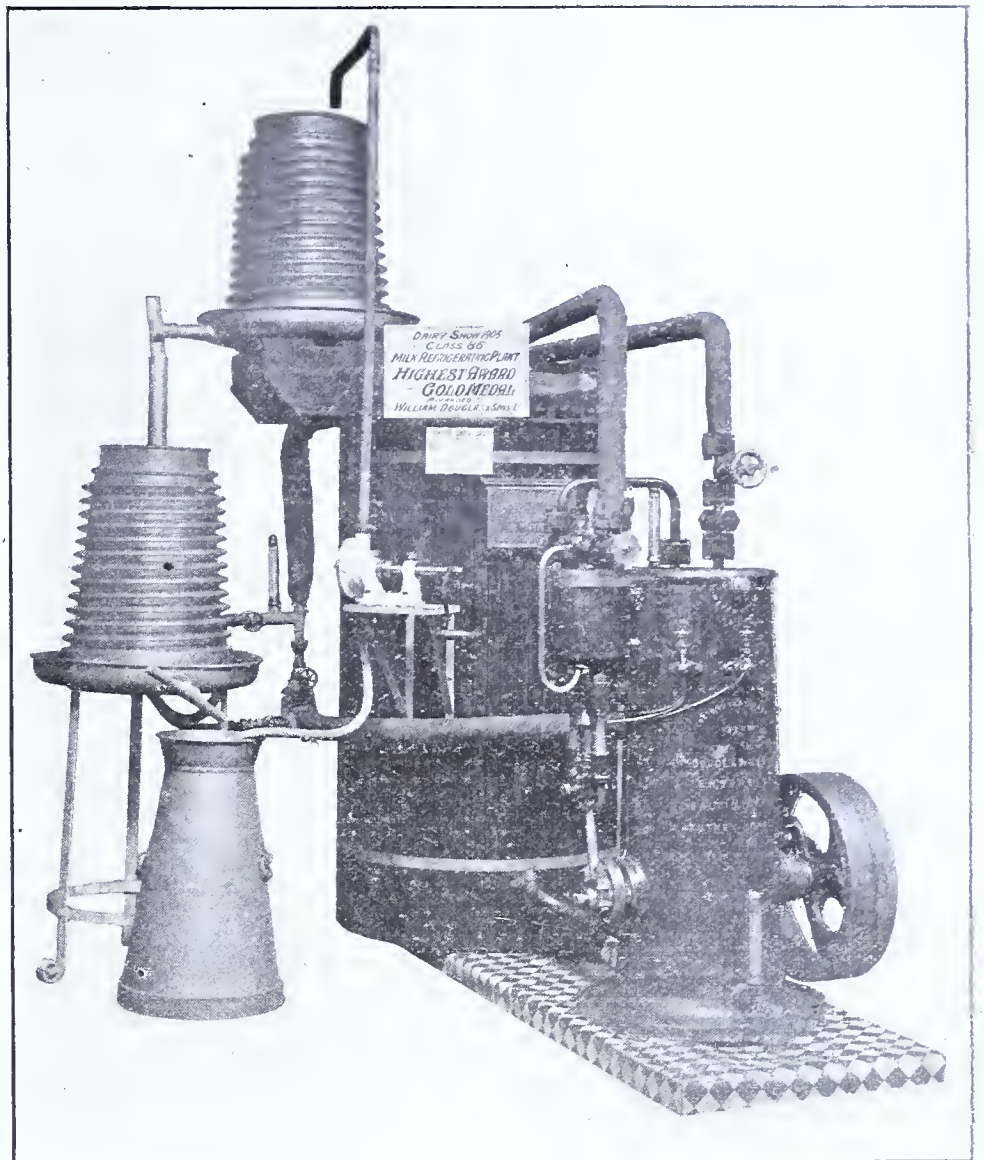
In the factory, also, the process of ripening and churning cream necessitates cooling appliances; and the cold storage of butter before shipment is likewise essential.

In view of the above facts, the British Dairy Farmers' Association instituted a competition at a recent exhibit in order to determine the best system of refrigeration as applied to dairy work. A number of conditions were laid down for competitors, so as to make it quite sure that a fair result would be reached.

The plant which obtained the highest award was exposed by Messrs. William Douglas & Sons, of Putney,

valves on the top of the cylinder are two stop valves, by which the whole system can be shut off from the compressor with no further loss of refrigerating gas than the small amount which may be in the top of the cylinder. The regulating valve is shown to the right on the top of the condenser with a stop valve underneath. The working pressure of the compressor is from 35 lbs. to 50 lbs., and ordinary cast iron packing rings are used for the piston head.

The gland is packed with soft cotton soaked in oil and also with one or two turns of Garlock packing, finishing with a rubber ring. The evaporator, which in the milk cooling plant is made relatively large, so that it may hold a good stock of brine, consists of a wrought iron cistern insulated with cowhair outside. Wrought iron spiral coils are used for the evaporation of the refrigerating agent in the evaporator. There are, as will be seen, two conical milk coolers. The great trouble with cylindrical milk coolers with spiral flutings has been the amount of soldering necessary. This soldering has



PLAN OF DOUGLAS MILK REFRIGERATING PLANT.

and is shown in the accompanying photograph and drawing.

The general arrangement will be well understood from the diagram. On the right is the refrigerating machine, which is the Douglas-Conroy patent, the refrigerating agent being sulphurous anhydride-SO₂. The compressing cylinder is, as will be seen, jacketed. This is for the circulation of water, and the inlet and outlet ports for the water are connected directly with the general water supply for the condenser. The jacketing is required in order to liquefy a small amount of the SO₂ in the cylinder, where it supplies all the lubrication necessary. The compressor is mounted on the side of the condenser tank, which is of cast iron, and the driving shaft runs through the body of the condenser, a gap being made in the condenser coils to permit of this arrangement; the shaft of course, runs in a sleeve. Above the suction and compression

been eaten away by the calcium chloride brine, and the coolers rapidly become useless. In those shown in the drawing, the spiral flutings are pressed out of one sheet, and the soldering is thus very much reduced. The mantle inside fits closely to the flutings and permits, it is said, only a very slight leakage of the cooling medium, so that the bulk of the refrigerant passes around in the flutings. The inside mantle is secured to the fluted mantle with two rubber joints, top and bottom, and it can be taken out in a few minutes at any time for examination or cleaning, or for the repair of damaged flutings.

In the majority of creameries, the milk is first cooled with water from the surface pipes, and obviously it would be a waste of energy to use artificially chilled brine to do any cooling which can be done by water alone. The top cooler therefore is connected to the water service, and more than

half the cooling can thus be done. The lower cooler is connected with the brine circulation by a "Douglas" concentric rotary pump fixed to the side of the condenser. The cold brine is drawn from the bottom of the evaporator, circulated round the flutings of the lower cooler, and then returned to the top of the evaporator. A by-passage is provided through which circulation is kept up when the cooler is not in operation, as, of course, it promotes the cooling of the brine to have it continually in motion among the coils, and this circulation provides a ready means of agitation. The milk to be cooled is elevated by another Douglas concentric pump, which is connected with the milk receiving tank. One of the advantages claimed for the above plant is its simplicity. It can, the makers state, be readily operated by one man.

The refrigerant, as stated, is liquified sulphurous acid gas. This gas is especially dried so that it is absolutely free from moisture: it is non-inflammable, and is sent out in strong steel cylinders for use. Sulphurous acid is well known to meat purveyors, as it is the material which forms the basis of bi-sulphide of lime, so largely used as a meat preservative. The fumes, although irritant, are quite harmless, and not injurious to health, as large quantities are daily used for ordinary disinfectant purposes. Sulphurous acid gas liquifies in the condenser at a comparatively low pressure, from 30 to 50 lbs. per square inch. It is a cheaply made article, absolutely non-corrosive, and its strong smell is a distinct advantage, as it permits of the instantaneous detection of leakages, while the escape of an odorless refrigerant would not be detected.

Cure of Opium Habit.

There has recently been discovered, in the Malay States, a plant which is said to have the property of curing the opium habit, so prevalent in China and the East in general. The scientific name of the plant is *combretum sundaicum*. Is a climber, of no hitherto known use. The leaves are boiled, and the infusion is said to counteract the craving for the drug. Some people ridicule the idea that the plant has any curative properties, but many cases have been reported where the medicine has been found to be effective. In Singapore, since its use has begun, the sales of opium have fallen off \$50,000 worth in one month—a striking proof of its efficacy.

Treating Flax.

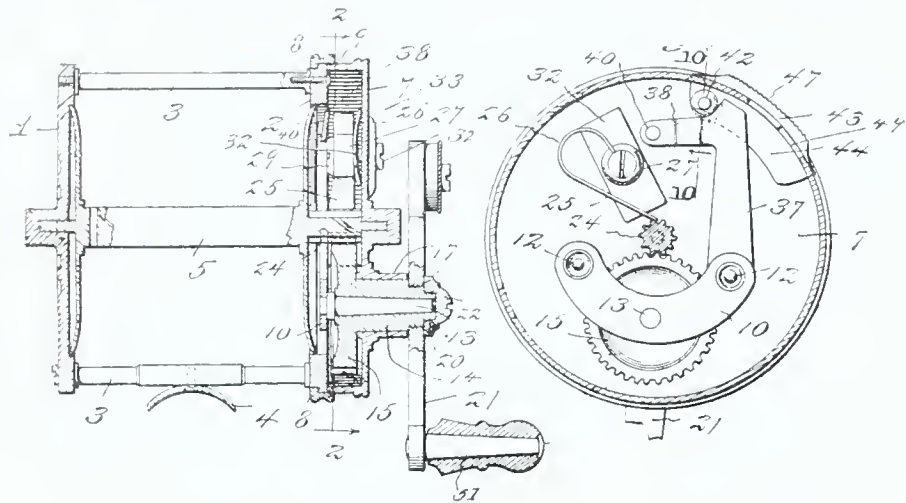
A new Australian process for converting worthless flax into a good fiber is described in the *London Commercial Intelligence* as follows: Sheaves of straw are immersed in a hot neutral solution for an hour, after which the flax is passed through rollers and sprayed, by steam force, with a special solution. The flax is dried and the straws broken and scutched in the usual manner. The same bath may be used repeatedly: the frequent use darkens the fiber, but this is no detriment for many purposes. It is claimed that the process can be carried on continuously, independent of weather conditions, and also that the fiber is produced so cheaply that it will ultimately, to a great extent, displace other fibers.

CLEVER NEW PATENTS.

FISHING REEL.—HAY RAKE AND STACKER.—RIDING CULTIVATOR.
CHAIR BACK HINGE.

Fishing Reel.

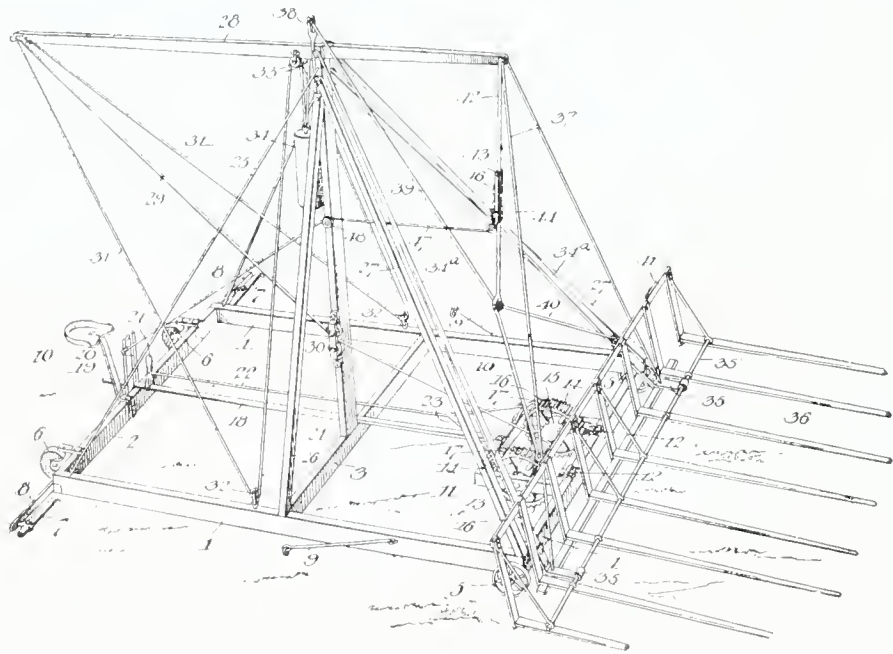
A novel fishing reel constitutes the subject matter of a patent granted to Mr. Frank Fullilove, of Owenton, Ky. The reel 5 is located in a frame 3, and at one end thereof is formed a casing 7. The hub of the reel has a pinion 24 in the casing, and a gear wheel 15, in mesh with the pinion, is formed with a hub 14, to the outer end of which is fixed a handle crank 21. The hub 14 is journaled on a tapered stud 13, carried by a bridge 10 fastened, as shown at 12, within the casing. A drag or brake 33 is pivoted on one of the fasteners 12, and has a lug 40 in engagement with the outer face of the adjacent end of



the flange of the spool. The stud 40 is carried by an offset arm 38, which arm has a beveled portion engaged by a head 42 carried by a projecting thumb piece 43. The usual click spring is shown at 25, one end engaging the pinion 24, the other being secured to a stud 27 passing through a plate 32. As thus constructed, all of the parts will be firmly and securely held, and it will be impossible for the crank to wear loose under any conditions of service, while the click-spring is so supported as to permit of extended use without a strain, and, further, the supports of the spring are of such character as to permit ready removal should the spring become worn or broken after long use.

Hay Rake and Stacker.

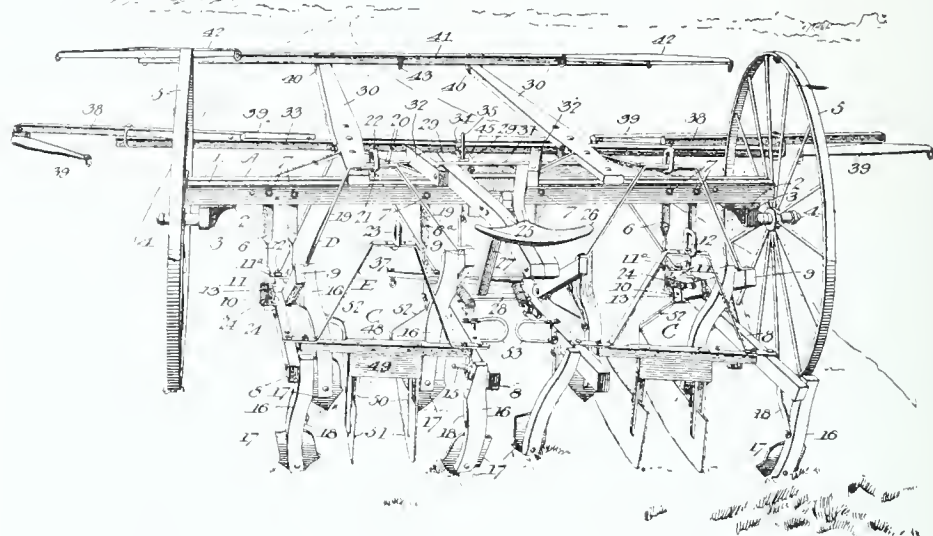
A combined rake and hay stacker has been patented by Mr. James Craig, of Garden City, Kansas. A suitably braced mast 24 is mounted on a wheeled frame, and pivotally connected to this mast by links 34a is a fork 36. Novel mechanism including levers and cables are employed for raising and lowering the fork. This mechanism is driven by a wheeled drum 15 journaled in the lower portion of the frame and mounted on the swinging frame 11 controlled from the rear of the machine by a lever 18. Suitable mechanism is provided for tilting the fork to deliver the load therefrom. When the gathering frame



becomes full, the lever 18 is lowered to place, with the power-wheels in contact with the ground, and the hand-lever 21 is operated to throw the pawls 17 into engagement with the power-wheels to prevent any retrogressive movement thereof. As the machine advances the rope 30 winds on the drum 15, and the gathering-frame is raised to the desired height. The load is then conveyed to the wagon or stack and dumped thereon at the proper time by pulling the rope 47. When it is desired to lower the gathering-frame, the hand-lever 21 is operated to disengage the pawls 17 from the power-wheels, and the hoisting-beam descends by its own weight, the counterbalance 34 serving to make this descent gradual and easy, the power-wheels being used as brakes, if necessary.

Riding Cultivator.

A new riding cultivator has been invented and patented by Mr. Philip Jarvis, of Cedar Rapids, Nebr., its object being to provide a machine which shall be simple in construction, durable and efficient in operation. The cultivator is of the gang type, and has a pair of relatively long outer beams and a pair of relatively short inner beams. Devices are employed for connecting the front end of each long beam with the front end of the adjacent short beam, and coupling boxes support the connecting devices. Stirrups are employed in turn for supporting the coupling boxes, and rearwardly extending fenders are

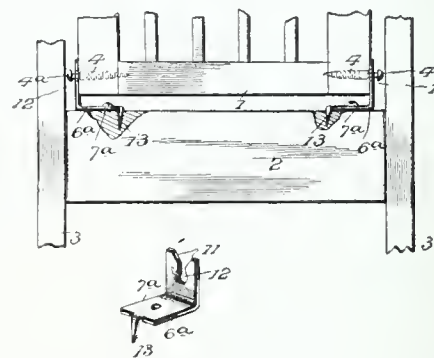


connected by straps with the couplings. An arch is employed for adjustably connecting the inner beams, and another arch independently connects the outer beams. A cross bar also connects the rear ends of the outer beams, and fender-guiding prongs depend from this cross bar. The cultivator or other implement carrying standards are connected with the several beams. The cultivator-gangs are constructed and arranged with a view to the right adjustment of the parts thereof that may be required by the conditions of the soil and the plants that are being operated upon. Thus the inner beams of each gang may be raised independently of the outer beams, or together with the latter.

Chair-Back Hinge.

Another resident of Williamsport, Pa., Mr. Oscar P. Breithut, has also secured a patent, the invention being a hinge for chair backs, particularly intended for Morris chairs. An object of the invention is to provide an improved hinge of this character which will serve as a strong brace between the back rail and legs of the chair, which will not only promote the durability of the chair while being used, but will strengthen the chair as it is being shipped from place to place and subjected to the usual hard usage incidental to transportation. As shown in the accompanying illustration, one of the hinge members consists of a plate 9a adapted to be placed upon the edge of a cross bar 2 of the chair. This plate has a spur at one end that is embedded in the cross bar, while its other end has an upstanding ear provided with a socket 12 and a

tapered mouth 11 opening into the socket. The plate is secured to the cross bar by a screw or other fastener passed therethrough. The back 1 of the chair has screws threaded into its opposite edges, and these screws are



provided with reduced pintles 12, and heads 4a. The pintles are so arranged that they are passed through the mouths 11 of the hinge members and engage in the sockets.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

UNIVERSAL ADDING MACH. CO. v. COMPTOGRAPH CO.

(Circuit Court of Appeals, Seventh Circuit.
August 11, 1906. 146 F. R. p. 981.)

1. PATENTS—ABANDONMENT—COMPUTING MACHINE.

The Felt patent, No. 628,176 for an improvement in computing machines, claims, 1, 2, and 4, which are broad and generic covering the use of a lateral movement in such machine to bring about the placing of the figures in parallel columns, are void, either for anticipation by the Hiett & Cable patent No. 580,863, or for abandonment if, as claimed, the invention was substantially perfected eight years before application was made for the patent.

2. SAME.

An inventor having grasped an idea and put it in mechanical form may not wait to secure a monopoly on the broad thought until everything in the nature of mere accessory improvement that makes it commercially better has been worked out and perfected.

BRADFORD et al. v. EXPANDED METAL CO. et al.

(Circuit Court of Appeals, Third Circuit.
September 10, 1906. 146 F. R. p. 984.)

PATENTS—INVENTION—PROCESS OF EXPAND- ING SHEET METAL.

The Golding patent No. 527,242, for a process of making open or reticulated sheet metal by slitting and stretching the sheet at the same time, is void for lack of patentable invention in that it describes merely an abstract idea without sufficiently disclosing means by which it may be put into practice.

CHADELOID CHEMICAL CO. v. FRANK S. DE RONDE CO.

(Circuit Court, S. D. New York. August 1,
1906. 146 F. R. 988.)

PATENTS—VALIDITY AND INFRINGEMENT— PAINT REMOVER.

The Ellis patent, No. 714,880, for a composition for removing paint and varnish and the process of making the same, which consists in dissolving a wax in a hydrocarbon oil or other suitable solvent, and the subsequent precipitation of the wax by the addition of an alcoholic body miscible with the solvent, the purpose being to thicken the composition and prevent the volatilizing of the solvent when applied, was not anticipated and discloses patentable invention; the remover described being more practicable and successful in use than any in the prior art. It is also infringed by a similar composition, in which acetone is substituted for alcohol, for which, in such composition and for the purpose employed, it is the chemical equivalent.

ROBINSON v. S. & B. LEDERER CO. et al.

(Circuit Court, D. Rhode Island. July 23,
1906. 146 F. R. p. 993.)

PATENTS—SUIT FOR INFRINGEMENT—VIO- LATION OF PRELIMINARY INJUNCTION.

That the violation by a corporation defendant of a preliminary injunction against infringement of a patent resulted from carelessness, and was not intentional, is no defense to contempt proceedings therefor, but may be considered on the question of punishment; and, such a proceeding being remedial, the penalty in such case may be properly measured by the damage resulting to complainant from the violation, and the costs and legal expenses incurred in the proceeding.

BOBBS-MERRILL CO. v. STRAUS et al.

(Circuit Court of Appeals, Second Circuit,
June 16, 1906. 147 F. R. p. 15.)

1. LITERARY PROPERTY—COMMON-LAW COPYRIGHT—RIGHTS OF OWNER.

The owner of a common-law copyright has a perpetual right of property and the exclusive right of first general publication, and may, prior thereto, enjoy the benefit of a restricted publication without forfeiture of the right of a general publication.

2. COPYRIGHT—RIGHTS ACQUIRED BY STATU- TORY COPYRIGHT—EFFECT ON COMMON- LAW RIGHTS.

The right to a common-law copyright has been superseded by statute, and hence where the owner of the common-law copyright elects to substitute the protection of the statute for that of the common law, he, on publication, abandons or surrenders his common-law rights, including his right of limited publication, in exchange for his exclusive statutory right to multiply copies.

6. SAME.

Under Rev. St. § 4952 [U. S. Comp. St. 1901, p. 3406] giving to the owner of a copyrighted book the right to copy and vend the same, protection against multiplication of copies and the incidents thereof constitute the only protection afforded by the copyright statutes to the publisher.

4. SAME—INFRINGEMENT—SALE OF LAWFULLY PRINTED COPY.

The sale of a lawfully printed copy of a copyrighted publication, in the absence of any contract, condition, or provision of forfeiture, is not an infringement of the copyright law.

5. INJUNCTION—INDUCING BREACH OF CON- TRACT—SALE UNDER RESTRICTIVE LICENSE—NOTICE—PROTECTION.

Where a copyrighted publication is sold under restriction that no dealer is licensed to sell at less price than \$1 per copy, etc., and a third person makes malicious and unlawful attempts to induce original purchasers to break their contracts, to the injury of the original seller, the latter is entitled to relief in equity.

6. SAME—EVIDENCE.

Complainant sold copies of a copyrighted book, in which was published a notice that the price of the book at retail was \$1 net; that no dealer was licensed to sell at a less price, and that a sale at a less price would be treated as an infringement of the copyright. There was no reservation of title to, or any interest in, or subsequent control over, copies sold in violation of the notice, nor any suggestion of an agreement on the part of the purchaser, or restriction on, or provision for, forfeiture of the title, nor any attempt to provide that a purchase should constitute an acceptance of the terms of the notice. Dealers to whom complainant sold the books were under no agreement to enforce observance of the terms of the notice or to restrict their sales, and complainant's proof failed to show that defendants had themselves violated any contract or had persuaded others to violate any contract with complainant, but that they had purchased their copies, intending to acquire the absolute title, nor did it appear that such copies were purchased from purchasers of complainant. Held, that complainant was not entitled to an injunction restraining the resale of such copies at a less price than \$1 per volume.

7. ELECTION OF REMEDIES—NOTICE—EFFECT.

Where a notice printed in a copyrighted publication recited that a sale at a less price than \$1 per volume would be treated as an infringement of the copyright, the publisher thereby elected to pursue that remedy for violation of the notice, and was precluded from maintaining an injunction to restrain the sale.

SCRIBNER et al. v. STRAUS et al.

CHARLES SCRIBNER'S SONS v. SAME.

(Circuit Court of Appeals, Second Circuit,
June 16, 1906. 147 F. R. p. 28.)

1. COPYRIGHTS—INFRINGEMENT—SALE OF COPYRIGHTED PUBLICATIONS.

Where an association of publishers of copyrighted books printed notices therein that the books were sold on condition that prices be maintained as provided by the regulations of the American Publishers' Association, but there was no statement in the notice or blanks used in the sale of the books of any claim or right under the copyright law, the question of the liability of a purchaser of such books for failure to maintain prices by reason of such notice was not one of infringement of copyright, but as to whether the publishers were entitled to relief in equity by virtue of their common-law rights independent of their statutory copyright.

2. COURTS—FEDERAL COURTS—JURISDI- CTION.

Where, in a suit in the federal courts to restrain the complainants' copyrighted publications at less than regular prices, there was neither diversity of citizenship nor claim for damages in the sum of \$2,000, questions not arising out of the copyright law could not be considered.

3. COPYRIGHTS—COPYRIGHTED PUBLICA- TIONS—SALE—RESTRICTIONS—ASSENT.

Where members of an association of publishers of copyrighted books sold the same through jobbers to persons who would not agree to sign a contract to maintain prices, assent to such contract could not be implied

from mere purchasers of books which might have been lawfully sold or bought on an express refusal to sign such agreement.

4. SAME—CONTRIBUTORY INFRINGEMENT.

Where there was no proof of any reservation of right in a copyright of certain copyrighted publications by their owner, or of an agreement by dealers from whom defendant purchased to abide by the rules adopted by an association of such publishers to maintain prices, or of any wrongful attempt on defendant's part to induce its vendors to break any contract with such publishers, defendant's sale of such publications for less than the regular price did not constitute a contributory infringement of the copyright.

SAXLEHNER v. EISNER et al.

(Circuit Court of Appeals, Second Circuit.
June 7, 1906. 147 F. R. p. 189.)

1. TRADE-MARKS AND TRADE-NAMES—IN- FRINGEMENT—PERSONS LIABLE—OFFI- CERS OF A CORPORATION.

Where the executive officers of a corporation held a full power of attorney authorizing them to act in all matters pertaining to the company, and the directors were practically nonentities, the corporation's entire activities being within the control of such officers, they could be personally charged with infringement of trade-marks and unfair competition in the transaction of the corporation's business.

2. SAME—INJUNCTION—EQUITABLE JURIS- DICTION.

Where defendants, as executive officers of a corporation, had personally directed the infringement of complainant's trade-marks, and in March, 1901, filed an answer averring that complainant had, long prior to the commencement of the suit, lost all exclusive right to the label as well as to the name and shape of its bottle, complainant was justified in alleging in a bill to restrain defendants personally from continuing such infringement, that defendants intended to continue the same.

3. INJUNCTION—CORPORATIONS—OFFICERS INDIVIDUALLY—EFFECT.

That a corporation, and through it, its officers, agents and servants, had been enjoined from further infringing complainant's trade-marks, and from conducting a business campaign of unfair competition, did not preclude complainant from obtaining an injunction restraining certain of the officers in their individual capacity from performing such unwarranted acts.

WHITE-SMITH MUSIC PUB. CO. v. APOLLO CO. (two cases)

(Circuit Court of Second Circuit. May 25,
1906. 147 F. R. p. 226.)

1. COPYRIGHT—CONSTRUCTION OF STATUTE.

The law of copyright, being statutory and conferring distinct and limited rights not existing at common law, must be strictly construed, and cannot be extended, either by resort to equitable considerations or to a strained interpretation of the terms of the statute.

2. SAME—INFRINGEMENT—MUSICAL COM- POSITION.

A copyright of a musical composition printed with staff notation is not infringed by a perforated record or sheet designed for use with mechanism to play the composition on a musical instrument not being a "copy" of the copyrighted publication within the meaning of the copyright statute.

SCHOCK v. OLSEN & TILGNER MFG. CO. et al.

(Circuit Court of Appeals, Seventh Circuit.
August 11, 1906. 147 F. R. p. 229.)

1. PATENTS—INFRINGEMENT—BARREL-WASH- ING MACHINES.

The Klant patent, No. 400,346, for a barrel-washing machine, construed and held not infringed.

2. SAME—ANTICIPATION.

The Schock patent, No. 605,138, for a barrel-washing machine is void for anticipation.

WELD MFG. CO. v. JOHNSON SERVICE CO.

(Circuit Court of Appeals, First Circuit.
August 15, 1906. 147 F. R. p. 234.)

PATENTS—INFRINGEMENT—HEAT REGULATOR.

The Johnson patent No. 542,733 for a heat-regulating apparatus using compressed air motors, controlled by a thermostat, to actuate a valve controlling the heat supply, was not anticipated by the Chadburn patent No. 502,090 for a ventilating apparatus, but is for a primary invention in its specific field, and the patentee is entitled to a construction

of its claims broad enough to protect him from infringement by a use of the general system with specific devices somewhat different in details. Also held infringed.

RAWSON & MORRISON MFG. CO. v. C. W. HUNT CO.

(Circuit Court of Appeals, Second Circuit.
June 16, 1906. 147 F. R. p. 239.)

PATENTS—UNAUTHORIZED REISSUE—EFFECT ON VALIDITY OF OLD CLAIMS REPEATED.

Where the drawings and descriptions of a reissue patent are identical with those of the original, the validity of claims of the original, which are repeated and separately stated in the reissue, is not affected by the invalidity of other claims, nor by the fact that the reissue itself was unauthorized.

RAILWAY APPLIANCES CO. v. MUNROE.

(Circuit Court of Appeals, Seventh Circuit.
August 11, 1906. 147 F. R. p. 241.)

PATENTS—VALIDITY AND INFRINGEMENT— CAR STARTER.

The Ripberger patent, No. 493,736, for a car starter, while it covers an improvement only on the prior art by a new combination of old elements, was not anticipated, and discloses invention. Also held infringed.

MCCASLIN v. LINK BELT ENGINEER- ING CO. et al.

(Circuit Court of Appeals, Second Circuit.
May 22, 1906. 147 F. R. p. 243.)

PATENTS—INFRINGEMENT—ENDLESS CHAIN CONVEYOR.

The McCaslin patent, No. 503,870, for an endless chain conveyor, claims 2 and 4, construed, and held not infringed.

LIBRARY BUREAU v. YAWMAN & ERBE MFG. CO.

(Circuit Court of Appeals, First Circuit.
April 11, 1906. 147 F. R. p. 245.)

APPEAL—DECISIONS REVIEWABLE—INTER- LOCUTORY DECREE—PATENTS—SUIT FOR INFRINGEMENT.

The rule of *Marden v. Campbell Printing Press Co.*, 67 Fed. 809, 15 C. C. A. 26, applied, to the effect that an interlocutory decree, adjudging certain claims of a patent valid and infringed, and directing an accounting, and other claims invalid or not infringed, is not final as to the latter, and an appeal does not lie therefrom by complainant.

YAWMAN & ERBE MFG. CO. v. LIBRARY BUREAU.

(Circuit Court of Appeals, First Circuit.
July 5, 1906. 147 F. R. p. 246.)

PATENTS—INFRINGEMENT—LOCK ROD FOR CARDS.

The Hunter patent, No. 628,886, for a lock rod for cards, while disclosing invention, is merely for a new mechanical arrangement of old elements, constituting an improvement on the prior art, and the invention is not so far an original one as to entitle the claims to a broad construction or application of the doctrine of equivalents. As so limited, held not infringed by the device of the Weidner patent, No. 760,404.

NATIONAL GLASS CO. v. UNITED STATES GLASS CO.

(Circuit Court, W. D. Pennsylvania. August
30, 1906. 147 F. R. p. 254.)

1. PATENTS—INFRINGEMENT—FURNACE FOR REHEATING GLASSWARE.

In the Schulze-Berge patent No. 411,131, for a furnace for reheating or fire-finishing glassware, claim 1, which covers a furnace "provided with a 'glory hole' or 'glory holes,' accessible from below, for the introduction and withdrawal of glass articles substantially as and for the purposes described," must be limited to a furnace which is capable of being combined and operated with the mechanism specified and covered by the other claims comprising the whole invention. As so limited held not infringed.

2. SAME.

The Caldwell patent No. 442,855 for a furnace for reheating and finishing glassware is not of a pioneer character, and the claims, which describe specific mechanism, must be limited to such mechanism or its equivalent. Claims 3, 5, and 7, which describe as an element of the combination therein claimed a horizontally revolving table supporting vertical rods for carrying the articles to be heated, and which, by its revolution, carries them through the furnace in the arc of a circle, are not infringed by a mechanism in which the carrier is an endless chain moving through the furnace in a straight line, and mounted on a movable frame so that the whole may be withdrawn from the furnace.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

Gust Pratts, Flint, Mich. Two patents.—Confectionery Mixing Machine and Candy Making Machine.—The first patent relates to mechanism particularly useful for stirring or mixing candy in the manufacture of the same, but not necessarily limited to this use. One of the principal objects is to provide, in connection with a receptacle for the material, simple and novel means for thoroughly mixing, stirring or commingling the material placed therein, said mechanism being arranged to act throughout the receptacle and consequently upon all the material placed therein. It consists of a circular receptacle having a substantially flat bottom, of upright shafts arranged centrally of the receptacle, cross arms carried by the shafts and operating in different horizontal planes, an inwardly and rearwardly inclined stirrer blade carried by one of the cross arms and operating over the bottom contiguous to the side walls of the receptacle, an outwardly extending stirrer blade carried by one of the shafts and rotating about the central portion of the receptacle, and oppositely rotating plows carried by the other cross arms and rotating in paths of movement between the paths of movement of the blades, said plows having oppositely extending wings that move the material both outwardly and inwardly.

The second patent relates to a combination machine for mixing and pulling candy, and one of the objects is to provide a novel and comparatively simple machine, whereby ingredients may be thoroughly mixed, and at the same time, candy can be efficiently pulled, the mechanism being compact and conveniently associated, and furthermore, being so arranged that either the mixing or the pulling means may be operated separately. This invention consists in the combination with a base, of rotatable mixing mechanism centrally mounted thereon, gearing for the same extending centrally beneath the base and including bevel wheels, rotatable pulling mechanism on the base above the mixing mechanism, gearing for the same including bevel gears located beneath opposite side portions of the base, a driveshaft extending beneath the base, power mechanism connected to one end of the drive shaft, countershafts respectively geared to the bevel gears of the mixing mechanism and the bevel gears of the pulling mechanism, a gear wheel mounted on one end of the drive shaft, gears secured to the adjacent ends of the countershafts, swinging supports journaled on said countershafts, idlers carried thereby and meshing with the countershaft gears, said idlers being movable into and out of the gear of the drive shaft when the supports are swung, and means for securing the supports against movement.

William S. Guthrie, Terrell, Texas. Three patents.—The object of the first invention is to produce a switch apparatus involving a plurality of switches, and a spring motor operating the switches in the desired order and at proper intervals, the contact elements of said switches being so arranged that the circuits will be opened suddenly in order to reduce to a minimum the possibility of arcing. The invention consists in the combination with a motor including a frame, a plurality of arbors, intermeshing gears carried by the arbors, and a motor spring, of a series of conductive disks carried by one of the motor arbors and provided with peripheral projections, a plurality of bell crank

switch levers mounted in the motor frame and cooperatively related with the disks, contact springs arranged to be engaged by the bell crank switch levers, and an electrical connection between the disk carrying arbor and the several contact springs, whereby the necessity of wiring the levers is avoided.

The second patent relates to improvements in that class of systems, wherein the movements of one or more secondary clocks are controlled and regulated by a master clock. The invention embodies a circuit closer comprising a contact element, a swinging arm pivotally mounted between its ends, a contact spring secured to the arm between the ends thereof, one of the ends of the arm being free and disposed longitudinally of the spring, said spring moving into and out of sliding engagement with the contact element upon the movement of the arm, and said free end of the arm being movable away from and against the spring to effect the rapid disengagement of the latter from the contact element, a motor having an element that engages the other end of the arm to that associated with the spring for effecting the movement of the arm, a detent for holding the motor against movement, and means for intermittently actuating the detent and thereby permitting the intermittent movement of the motor.

The object of the third patent is to produce a switch apparatus embodying a series of switches and a rotary switch operating member common thereto and arranged to be driven by a motor of suitable character to effect the operation of the switches in any desired sequence or order, the various elements of the apparatus being combined in simple, durable and compact form. The switching apparatus comprises a switchboard having a bifurcated end, a drum mounted therein and provided with several circumferential series of projections, spring-supported binding posts extended through the board and having enlarged heads constituting stops and binding screws in the heads, a shaft mounted on the board and having a binding screw at one end thereof, a series of spring-retracted switch arms each having a bearing sleeve carried by the shaft and each having its opposite ends in operative relation to the drum and a binding post respectively, a feed wire retained by the screw in the shaft, and distributing wires conducted to the several posts.

Christian Heilrath, Sacramento, Cal., inventor. Eight patents. Two Trace Holders, of which Edward A. Meister, Sacramento, Cal. is assignee of part interest; an adjustable shade bracket, a combination tool, a tooth brush, a water filter, a spiral slip loop, and an adjustable axle.—The first patent discloses a trace holder, designed particularly for use on light whiffletrees, and adapted to securely retain a trace on the end of the same. The trace holder, which is secured to the whiffletree by a single fastening device, comprises an attachment plate provided with a tapered lug, a hook pivoted to the lug and having a longitudinal socket, and a coiled spring housed within the socket and provided with means for engaging the opposite faces of the lug for holding the hook in its open and closed position. The spring is arranged so that it will be equally effective in either position of the pivoted hook.

The trace holder of the second patent is designed to be applied to a whiffletree having the usual trace-receiving tongue and eye, without necessitating any alteration in the construction of the whiffletree, and while it is capable of securely retaining a trace on the tongue, it will enable the former to be quickly attached to and removed from the whiffletree. It embraces a support consisting of a plate having an opening to receive the

shank of the tongue, and interposed between a shoulder of the latter and the end of the whiffletree, and a trace-holding hook. The plate is provided with a projecting lug, and the hook, which is pivoted to the lug, co-operates with the tongue.

The third patent discloses an adjustable window shade bracket, adapted to be attached to a window frame or casing by a single fastening device and capable of ready adjustment to suit shade rollers of different lengths, whereby the injury to the window frame or casing resulting from the frequent changing of a fastening device is prevented. The device comprises a bracket provided with an arm having a slot, a lever provided at one end with a head having an approximately wedge shaped portion, and a pivot passing through the head and through the slot of the arm to permit the head to be turned longitudinally or transversely of the arm. The lever is disposed longitudinally of the arm, when the head is in engagement with the same, and the means for adjustably securing the bracket to the window frame will be concealed by the window shade roller.

The fourth patent relates to combination tools, more especially pocket knives, and it is the aim of the invention to provide a knife having a cork screw and leather punch, and capable also of being used as a pair of pliers, a wire cutter and a can opener. It consists of a pocket knife having its handle divided longitudinally to form two sections provided with flat opposing faces to permit them to fit closely together in flush relation throughout the contour of the knife when closed, each section being equipped on the outside with blades or analogous devices, which are exposed for operation at all times, a rivet constituting the pivot and passing through and securing the sections at one end of the knife, and arranged at right angles to the plane of the movement of the sections in opening and closing for holding the flat inner faces of the sections in frictional engagement, and co-operating rigid jaw extensions formed on the sections beyond the rivet connection, the jaw of each section being projected laterally to overlie the other section and arranged to slide thereon. A can opening blade is secured to the handle by the pivot, and it co-operates with the jaws to form a can opener when the handle is closed. The jaws are provided at the inner ends of their engaging faces with wire cutting notches, which register when the jaws are open, and the edges thereof sever the wire when the handle is closed.

The tooth brush of the fifth patent is adapted to be compactly folded to enable it to be conveniently carried in the pocket or in a valise, and it is provided with means for protecting the bristles from dust and moisture. It embodies a brush provided with a head having extended beveled edges, and a guard or cap arranged to cover the bristles of the brush and having flared portions adapted to clear the bristles and fit against the beveled edges of the brush head. The guard, which is provided with ventilating perforations, has a shank connected with the handle of the brush, and having a tapered extension, forming a nail cleaner, and also operating to engage the handle of the brush, so that the shank of the guard will form an extension of the handle of the brush, when the latter is in use.

The sixth patent provides an improved spiral slip loop for hitching posts, by means of which a slip noose may be readily formed on a rope or cable. It is of particular value in connection with heavy ropes, as it permits the same being securely attached to a post or other device without being knotted. The loop of this invention comprises a slidable wire spiral adapted to receive and permit the free passage therethrough of a rope, the convolutions of said spiral

being spaced apart sufficiently to allow for the introduction and removal of the rope, and an integral closed eye located at one end of the spiral and formed by bending one end of the wire so that the terminal thereof abuts against an intermediate portion of said wire, said eye being offset from the spiral and extending longitudinally with respect thereto.

The seventh patent aims to provide an axle having a spindle which will afford continuous, unbroken bearing surfaces to the action of the hub, and which can be shortened to take up wear, said shortening being accomplished with great ease and expedition, without the necessity of re-dressing or otherwise finishing the spindle or parts thereof. The invention consists of an axle spindle having a reduced threaded stem projecting from its outer end, forming a shoulder at the juncture of the stem and the spindle, a plurality of metallic washers threaded upon the stem, the innermost one being abutted against the said shoulder, the others being firmly abutted, one against the other, and held against adjustment or movement on the stem, said washers having their peripheries dressed down so that their outer faces form an unbroken continuation of the surface of the spindle, and means for defining the joints between the washers.

The eighth patent relates to water filters for household purposes, and the object is to provide a novel structure of a simple nature which constitutes in effect a filtering faucet, that is to say, unfiltered water under the direct pressure in the main can be drawn off, and when so drawn, the filter is automatically cleaned. It embodies a tubular casing having an inlet at one end and a discharge nozzle at the other end, a valve seat located in said nozzle, an open-ended filtering barrel extending longitudinally through the casing in spaced relation to the walls thereof, and having its interior in communication with the inlet and with the nozzle, a delivery device communicating with the space between the barrel and casing, a guideway located in substantial alignment with the casing and the barrel, and arranged at the end of the same opposite the nozzle, a valve stem having one end threaded into the nozzle and projecting from the same, said stem extending through the barrel and having its inner end movably mounted in the guideway, a valve mounted on the stem and operating in the nozzle into and out of co-action with the valve seat, and a brush carried by the stem between the valve and the inner guided end, said brush operating against the inner wall of the filtering barrel.

Christian Heilrath and Samuel M. Taber, Sacramento, Cal. Check Hook.—It is the aim of the present invention to provide a check hook capable of enabling a check rein to be easily and quickly engaged and disengaged therefrom, permitting the check rein to be withdrawn by a direct upward and forward pull, so that the forward motion of the head of an animal will carry the check rein away from the check hook, to prevent the former from accidentally catching on the bill of the latter. The device comprises a hook, and a substantially L shaped catch, mounted in rear of the hook, and composed of an upwardly extending arm normally fitting against the rear face of the end of the hook to close the entrance or mouth of the latter and extended above the hook to form a handle, and an approximately horizontal arm extending from the lower end of the said arm and arranged to be swung to an upright position with its upper or rear face substantially flush with the rear end of the hook, whereby the check rein will be thrown out of the hook and prevented from catching on the end of the same.



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FOR SALE—Patent No. 854,019, dated May 21, 1907. Pen and Pencil Holder. Nothing like it. Every person needs one. Good thing for manufacturers. Can be made very reasonable. Big money in it for some one. For particulars address, F. L. Benstead, Box 87, Hoxie, Ark. nov

FOR SALE—Patent No. 857,241, dated June 18, 1907. Canadian patent applied for. Harness hook that will securely hold the harness. Easily and quickly operated. Will prevent the \$5,000,000 loss in the United States each year caused by horses pushing the harness down and tramping upon them. State rights for sale or states on royalty. Address, Jonas H. Hittle, Mackinaw, Ill. oct

FOR SALE—Outright with privilege of obtaining foreign patents. Patent No. 856,025, dated June 4, 1907. Head Rest and Pillow Holder. Adjustable. Any reasonable offer considered. Address, Mrs. Alice H. Brown, Ludlow Station, R. F. D. 2, Box 55, Covington, Ky. oct

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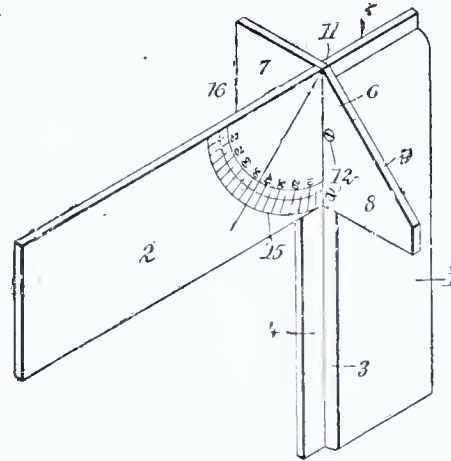
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WASHINGTON, D. C. SEPTEMBER, 1907.

The Future of Steel.

In an article reviewed in another column, a graphic description is given of the future of steel. Although this is the Age of Steel, its greatest glory is yet to come. The cities of the future are to be made of steel—the houses in which we live, the roads on which we walk, our furniture, our utensils. We have already built our cities twice, once of wood and once of brick. For twenty years a few high city structures have been made of steel; but the private dwellings of the future will be largely built of this material. "Expanded steel," which resembles a mesh made by steel ribbons, is replacing laths. Ornamental steel ceilings are replacing plaster. Corrugated iron in thin sheets is replacing wooden siding in the building of factories. As noted in a recent editorial, many new uses are being found for steel in connection with cement—a combination not only fireproof, but apparently earthquake proof. As steel plants are now making cement from their slag, they will reap a double profit from this method of building.

Several American cities can now boast steel frame churches of the largest size. New York's magnificent Subway is practically a thirty-mile tube made of steel and cement, just as its elevated railway is a 30 mile steel bridge. That colossal structure, the new Williamsburg Bridge between New York and Brooklyn, required 45,000 tons of steel. In a sky scraper of the first class, with some eighteen acres of floor space, ten thousand tons of steel are riveted together.

The railways, already huge consumers of steel, are to use this material still more extensively. Not only rails, but ties are to be of steel. The INVENTIVE AGE for March last contained an account of one of the new steel cars which the Pennsylvania is equipping for its passengers. This is only the beginning: the day is at hand when not only Pullmans but freight and baggage cars will be of steel, instead of wood. Steel roadways have been tried and not found wanting. The relatively low expense, their great

durability, and the demand for better highways that has come with the rise of the automobile, may ensure their adoption in residence streets and in the vicinities of our cities.

The rolling mill of the future, it is predicted, will become still more automatic.

Labor has become an insignificant part of the apparatus. All that many a workman needs now is an ear to hear an order, an eye to see an electric button, and a finger to touch it.

Steel has forced its way, in the commercial conflict of commodities, above the precious metals. Watch-screws, for instance, are worth over fifteen hundred dollars a pound, and hair springs twice as much. Twenty-five pounds of gold must be given for two pounds of these tiny nine-inch threads of steel. When the swift, frenzied Bessemer converter, which was especially suitable for the preparatory period of speed and quantity, is replaced by the slower and surer open-hearth process—and even Mr. Carnegie predicts this—then steel makers will gradually rise to higher standards and more artistic aims.

The open heart furnace, to quote from the article mentioned, is to be the caldron of civilization. Out of its fiery depths will come not only the locomotives, the steamships, and the steel cities of the future, but also the lancet of the surgeon, the telescope of the astronomer, the needle of the explorer and perhaps the "airy navies grappling in the central blue." Out of it will come many a new automatic machine which is today no more than an inventor's dream. As civilization rises, so the quality and uses of steel will rise. Not even the human race has within it more possibilities of development than the red iron-ore of Minnesota and Alabama.

Waterproof Paper.

There has been considerable study of late years of methods of treating paper, in its various forms, so as to increase its usefulness for various industrial and household purposes. A recent number of the INVENTIVE AGE contained an article on clothes made from paper; and now comes a report from one of our Consuls in Germany, in regard to processes of rendering paper waterproof. The principal use for this material is to be in the manufacture of cellulose vessels. One method consists in treating the sheets with a hot mixture of asphalt, turpentine, and linseed oil saturation of glue. Another consists of saturating paper or cellulose articles in a solution of resin soap, then immersing them in a hot bath of zinc chlorid, drying, and treating with paraffin oil. The resultant products are strong, tough and pliable. A waterproof pasteboard is secured by immersing sheets of ordinary paper in a bath of nitric acid or the solution of a nitrate, placing the sheets one on top of another, and then submitting them to heavy pressure. Solutions of varnish in linseed oil are likewise employed for rendering a surface waterproof.

Paper may also be given a treatment to make it like parchment, which operation, like tanning, is essentially

chemical, and effects a remarkable change in the physical properties of the article handled. When carried out with partly diluted sulphuric acid, sheets of pure cellulose paper are immersed for a few seconds in the liquid, then thoroughly washed in water, dipped in an alkaline solution, and washed again. This brief treatment decreases the thickness of the paper over one third, increases its specific weight in the same ratio, and triples or even quadruples its strength. There is also a notable gain in homogeneity and transparency. The new product is not affected by boiling water, i. e. is not softened and disintegrated, as ordinary paper would be, while it has an increased affinity for tinctorial substances.

The brief exposure of the paper to the sulphuric acid has changed the exterior of the cellulose fibers to a gelatinous mass, which binds the fibers so closely together that they form a continuous mass, which, being insoluble, constitutes a waterproof substance.

In order to render paper vessels waterproof, the essential features of the parchmentizing might be applied to their external surface. This would involve no material increase in the strength of the entire mass. Another, and perhaps better method, would be to apply freshly formed sheets of vegetable parchment under strong pressure to the inner and outer surfaces of the article. It will probably be found that improvements in the manufacture of paper vessels, aiming at an increase of tenacity, can preferably be brought about by mechanical operations quite distinct from the chemical reactions producing waterproofing, although both of these advantages are secured by a single change in the case of the preparation of thin sheets of paper parchment.

Many people believe that, so far as the preparation of waterproof pasteboard is concerned, the best success is obtained by methods based on the principle of changing paper into vegetable parchment. Waterproof cardboard has already been manufactured by immersing sheets of vegetable parchment in nitric acid, placing the sheets on top of one another, and then submitting them to heavy pressure.

Chemical Foods.

The extent to which food is adulterated is not generally credited, in spite of the warnings issued from time to time by the Department of Agriculture. Chemistry supplies substitutes for a surprising variety of food stuffs—not all of them, be it understood, of a harmful character. Many, however, are cheaper than the products which Nature supplies us, and consequently are adopted to a great degree by those who supply food on a commercial scale. An amusing account appears in a late number of the *Technical World* magazine, of a chemical dinner which a scientist, on a bet, prepared for his friends. The object of the repast was to demonstrate the possibilities in the way of substitution of arti-

ficial, manufactured food for the natural article, and all of it was prepared in the laboratory.

The menu of this "synthetic dinner" as the chemist-chef called it, included green turtle soup, biscuit, roast ptarmigan with currant jelly, raspberry sherbet, Mexican pear salad, vanilla ice cream and coffee, with such wines and liqueurs as sauterne, Martini cocktails and creme de menthe. The soup was formed of extract of turtle flavored by artificial sherry, salt and capsin. In the biscuits, a synthetic starch took the place of flour; this was mixed with tartar, saccharine, bicarbonate of soda, and sanatogen, which consists of casein and sodium glycerophosphate diluted with water—a product which has the appearance and taste of milk, but has no nutritive value. The currant jelly never saw a currant; the pear salad was composed of chemicals. Egg was made of protein, starch and fat. The raspberry flavor of the sherbet was produced by a delicate adjustment of ethers. For the ice cream, the chemist simply took some refined cotton seed oil and placed it in a centrifugal machine which revolved at a velocity of 3,000 revolutions per minute. A beautiful emulsion was produced, and was then frozen. The flavor was obtained by the addition of vanillin, glucin and nitro-benzol. The coffee was an extract of cereals, produced by pouring hot water upon a mixture of ground chicory, wheat and peas.

As for the wines, it is easier to see how they could be evolved. The creme de menthe was distilled from peppermint, balm sage, cinnamon, orris root, ginger and alcohol, colored and sweetened. It was pronounced superior to the real article. The cocktail was composed of alcohol, saccharine, absinthin and aniline yellow. As for the sauterne, it was made up of such appetizing constituents as malic acid, tartar, acetic ether, glucin, quince essence and naphthol yellow, with the addition of alcohol.

In view of the fearful combination of chemicals enumerated, it is not without surprise that the world hears that the eaters of this famous dinner actually enjoyed the food, and are still living and eating in undiminished health and gastronomic felicity. It may be true, as Professor Stillman, the originator of the dinner, insists—that much of the general food adulteration is not injurious. He declares that since nature works her wonders in the growing of foods through chemical elements, it is quite legitimate for the chemist to follow her example, and use the same elements. Nevertheless, most of us would probably have better appetites for our food, and fewer quams of digestion, if we did not know that the butter was composed of oleo oil, the jellies of glucose, the bread of synthetic starch and sanatogen, and the ice cream of cotton seed oil.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription, one dollar a year.

Telephones Under Water.

Many of the vessels that ply the Great Lakes are employing wireless submarine telephone service, in order to obtain danger signals during storms. At all the rocks and shoals are located lightships or buoys with big bells, which are rung during fog and bad weather, but often these are not heard, and a vessel may easily be misled. With the submarine telephone equipment, these bells can be heard for a distance of two or three miles. A telephone receiver is placed in the ship's pilot house, and transmitters are located in the lightships and buoys. Water is a better conductor of sound than air, and being below the surface, communication is not interrupted by wind, etc. The sound is conveyed to the receiver on the vessel with great distinctness, and the service has so far worked with success.

New Way to Cut Steel.

There are few processes more dangerous than the sawing of steel; not only on account of the great power required in running the cutting tools in the case of tempered metal, but also because of the small particles of steel which are scattered through the atmosphere and breathed into the lungs of the workmen. French engineers have recently devised a new method of cutting steel which avoids these perils. A small jet of oxygen gas is the instrument employed, and has proved itself most efficient. The complete apparatus comprises two pipes which move along the mark to be cut. From the first pipe issued a jet of mingled oxygen and hydrogen, producing a flame which first heats the metal red hot. The oxygen jet issuing from the second pipe literally burns away the heated metal. The cutting is very quickly done, the heat not having time to be dissipated, and no fusion of the metal takes place. The section is as clean as that made by a saw, and of no greater width. The method has a special advantage in that the section of the pipe, plate or other object to be cut, may be made according to any pattern desired.

Automatic Letter Carrier.

Among the manifold conveniences of the apartment house must now be counted a device for delivering letters automatically to the various flats. In most apartment houses the mail is left in a little box marked with the name of the tenant; but the newest buildings have an apparatus for separate delivery, so that occupants are saved the trouble of sending even as far as the front hall for it. The postman places the mail in an automatic carrier on the ground floor, and by merely shutting the door, the electrical current is turned on and carries the letters to locked boxes inside the apartments. The device, which is simple, consists of a straight up and down well, about 18 inches square, running the height of the house, and containing an elevating and lowering apparatus which carries a tray with metal boxes. The postman has a key to the plate glass door enclosing the carrier, which, when

opened, reveals three rows of small metal boxes, one for each flat. The postman drops the mail in the proper box, closes the door which locks itself, and the carrier starts upward. By a simple contrivance the boxes are dropped off from the carrier at the apartment where they belong, and at the same time overturned, so that the mail falls out in the locked receptacle inside the apartment. The automatic carrier keeps on going up until it reaches the top, when it descends again, picking up the boxes as it comes down.

A Suggestion for Reducing the Cost of Reinforced Concrete Construction.

The various improvements which are taking place from time to time in all branches and departments of the concrete industry, the infusion of new ideas, and the more effective execution of old ones, are bringing both initial and ultimate costs lower and lower each year. Conditions which at present obtain, warrant placing the estimate for a concrete structure at a figure nearly identical with that of heavy timber mill construction.

Within the last ten years, improvements in the method of manufacturing and handling of cement, has reduced the price of this essential some 50 per cent. For analogous reasons, namely, recent improvements in crushing machinery, the hardest of stone can be broken and crushed at an expenditure much less than the process of a few years ago necessitated.

It will be noted in this connection that contractors whose work has been such as to make for success are constantly so systematizing their work as to benefit future construction from past experience. Wooden forms have always proved a large factor in the cost of concrete buildings. In order to reduce the cost of such forms, in so far as may be consistent with proper execution of the work involved, the Frank B. Gilbreth organization has instituted the practice of constructing working models, made on a scale of 1-8 to the inch, showing the latest and best practice, and the most economical jobs that this organization has erected. Such models have been sent to a new job to be inspected, together with a notice that prizes up to \$25. would be given to the workman offering such suggestions as may cut down the cost and labor on materials; make for greater speed in constructing or in taking down forms, prolong the life of forms, thus increasing the salvage at the completion of the given job; or permit forms to be taken down with the least possible jar to setting concrete.

The last item in particular, is of especial importance, and has often been neglected by engineers, devoting their efforts in full or in part to work along reinforced concrete lines.

Such a method has also been found to give the benefit to this contractor's organization of the ideas of all the form builders who have at any time been in the employ of other contractors. Incidentally, it affords the further benefit of an intelligent interpretation by local carpenters.

The latter factor often completely upsets the most economical ideas in forms designed in another part of the country because of the impossibility of getting form lumber in the usual standard sizes.

New Things in Steel.

Nearly half of the steel of all the world is produced in America. In the last three years, Uncle Sam's output has been enough to outweigh all the men, women and children on the globe. Our furnaces annually make enough iron to put a belt around the earth ten feet wide and an inch thick. Steel has produced our billionaires, has evolved new standards of wealth, has created huge industrial centres, and has been an important factor in the general increase of prosperity in this country during the last decade. Considered with regard to its numbers, its wealth and its organization, there is no trade in the world to equal our steel and iron industry. And yet it is expanding steadily. The new uses for iron and steel, says Herbert Casson in a recent magazine article, are increasing daily. It is only a matter of time, for instance, until railroads will have to buy steel ties as well as steel rails. The heavier traffic and increased cost of wooden ties will make the steel tie a necessity. Many railroads have already thrown out wooden ties and are using steel ones. Such an improvement will enormously increase their steel bills. The railroads are today buying one-eighth of all the steel made, and a ton of ties will not go half as far as a ton of rails. At the Homestead works there is already a steel tie department—the germ of a new industry.

As for the pressed-steel car business, that is an established success. The underground railway in London is equipped with American steel cars. Steel trolley cars are running on the streets of our cities. Six months ago the first steel baggage car was placed on the Erie railroad. The frequent loss of life in wooden passenger coaches, which are easily telescoped in the event of a collision, is compelling railroads to consider the steel car proposition. Among the cars exhibited at the St. Louis Exhibition, not one was made of wood.

The cities of the future, Mr. Casson declares, are to be of steel. Wood has had its day in our urban construction. —The recent disastrous fires in Buffalo, Baltimore and San Francisco have shown that the steel frame is not enough. As long as wooden floors, partitions, doors, window frames, etc. remain, there is danger. Our total fire loss is between one and two hundred millions a year. In the last 24 years, more than three billions have gone up in smoke. And our timber supply is approaching the point of exhaustion: so it is not unlikely that the boys and girls now in the public schools will live to see the passing of the frame house, and the substitution of a structure made of cement and steel.

Take another item—wire. It is hard to realize, but true, that there are twice as many millions in wire as in structural steel. At its present rate of increase, wire will soon require more steel than rails. Out of every ten pounds of steel produced, one is manufactured into wire. Nothing else takes so many forms. It can be made

into a Brooklyn Bridge cable, or into an almost invisible thread, one-tenth as thick as a hair from your head. It may be woven into a cage front for a tiger, or into a fine spun gauze with 40,000 meshes to the square inch. You will find it in your piano, sustaining a tension of twenty tons, and in your watch, made into the tiny hair spring. The uses of wire are innumerable.

Today, even in the most insignificant items, there are millions to be made. Last year King Cotton paid two and a half millions to King Steel for cotton ties alone. A carpet tack is not an imposing article of commerce, yet a single factory in Chicago is producing three million pounds in a year. A wire nail looks unimportant enough, yet anyone who owned the thirteen million keys of wire nails that we produced last year, would possess a fortune.

Almost every week the newspapers announce a new use for steel. Steel bathtubs are being stamped out at the rate of a hundred and fifty a day. Steel furniture is worrying the furniture makers of Michigan. Barrels, it is said, will henceforth come from the steel mill and not from the cooper shop. As we use three hundred million barrels a year now, this one item may mean new plants, new multimillionaires. There has been, for several years a block of steel roadway in New York. To equip a road with these steel plates would cost, it is said, not more than \$1,500 a mile; and it is freely predicted that the roads of the future, especially in the suburbs of our large cities, will be of this kind. So many and so varied are the new things in steel, that Mr. Casson exclaims in an outburst of enthusiasm "In the steel works of America, fact has beaten fancy. The mechanic has outdone the poet. It is a dream of Archimedes come true."

Canning Speeches.

The government recently received a phonographic record of a speech made by the emperor of Germany, and this led to the suggestion that the utterances of other statesmen might be preserved in the same way, so that the Congressional Library is about to install a department where phonographic records of speeches made by distinguished persons from all parts of the world will be preserved for the benefit of future generations. The French and Austrian governments, says the *Pathfinder*, have for some time been filing away records of the famous voices of the stage for the benefit of posterity, and the Smithsonian Institution has some interesting records of Indian speech. If these prove permanent, they will undoubtedly be prized two or three hundred years from now, and will have a linguistic value besides, as showing the changes in spoken language that are constantly taking place.

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Nozzle. Spraying J. C. Hull
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Circuit closing. Rotary..... L. Hutchinson
Circuit closing device..... R. C. Cram et al
Cleaning and grading machine..... F. A. Orton
Cleaning and lubricating compound..... S. Kem
Clevis..... R. H. Sanker
Clothes drier..... E. G. Smith
Clothes line reel..... J. A. Levine

- Clothes pounder.....J. A. Vallee
Clutch.....H. A. Williams
Clutch, Friction.....O. A. Johansson
Clutch, Mechanical.....R. F. Whitney
Clutch, Motor.....H. A. Balcome
Coaster brake.....P. P. O'Horo
Coat hanger.....I. D. Fellows
Cock for flexible tubes. Stop.....C. O. Towne
Coin counting, packaging and labeling machine.....J. J. Farrell
Coin delivery apparatus.....F. Wever
Combination or keyless lock.....2 pats.
Concrete building block. Reinforced.....O. M. Farrand
Concrete building mold.....S. M. Kemp
Concrete mixer.....J. L. Ingersoll
Concrete pipe molds. Core or inner casing for.....W. L. Jones
Concrete structure. Reinforced.....S. H. Lea
Concrete tile making machine.....W. Wettlaufer
Concrete wall.....J. L. Peetz
Condenser.....C. E. Currier
Condenser, Surface.....J. M. Thompson
Conductor's signal.....I. P. Smith
Controlling device.....F. J. Stifka
Cooky making machine.....F. Werner
Cop and spindle connector.....F. J. Prue
Cord adjuster.....H. G. Hatfield
Core arbor.....R. Yates
Corkscrew.....M. E. Johnson
Corn husking device.....F. Shimerda
Corn shock loader.....W. G. Osborn
Corner clamp for show windows, show cases, and the like.....C. W. Condie
Corset connection.....W. H. Trebilcock
Cotton picker.....H. S. & H. E. Houghton
Cradle.....D. M. Scaif
Crate.....C. H. Williams
Crusher and pulverizer.....O. J. Moussette
Cue tip holder.....A. H. den
Cultivator.....M. Mitchell et al
Cup setting.....C. Wilson
Curtain pole.....J. W. Freeman
Curtain rod.....B. I. Brayton
Cutter.....G. Meyers
Cutting tool.....W. McCormick
Cycle, Motor.....W. F. Schmoelle
Damper regulator.....J. Scales
Dental syringe attachment.....W. C. Middaugh
Detachable handle.....C. E. Trewbella
Dish washing machine.....G. A. Beidler
Disinfectant candle.....C. B. Dolge
Disinfecting and deodorizing.....E. Fournier
Display receptacle for small articles.....J. C. Diamant
Distilling organic matters.....T. M. U. von Post
Door fastening device. Sliding.....H. D. Nichols
Door sealer.....J. H. N. Peterson
Double action press.....J. J. Rigby
Draft attachment.....G. A. Rich
Draft equalizer.....W. S. Livengood
Drafting instrument.....L. E. Paddock
Drafting machine. Universal.....W. W. Clans
Dye and making same. Anthracene.....M. Isler
Dye and making same. Blue cotton.....A. L. Laska
Blue and making same. Blue disazo.....A. L. Laska
Dye. Azo.....C. Schraube et al
Dye. Bluish black azo.....O. Dressel et al
Egg case.....C. M. Reed
Egg lifter.....C. M. Reed
Egg tester.....C. E. Dyer
Egg tester.....C. M. Reed
Electric current distributing systems. Means for controlling.....J. L. Rontin
Electric current regulator.....D. R. Knapp et al
Electric cut out.....E. O. Jackson
Electric furnace.....R. C. Unger
Electric heater.....E. H. Abbott
Electric light bracket.....G. Gantier
Electric light support.....W. A. Williams
Electric lights. Contact plug for sockets for.....F. W. Jaeger et al
Electric motor automatic starter.....W. C. O'Brien
Electric switch.....J. M. Andersen
Electric terminal.....G. D. Pogue
Electrical apparatus. Base fastening device for.....L. Bates
Electrical condenser.....C. Z. Davis
Electrode. Storage battery.....T. A. Edison
Electrolytic cell.....reissue. G. A. Gabriel
Elevated carrier.....reissue. H. Skreberg
Elevator controlling mechanism.....W. H. Hultgren et al
Elevator guide lubricator.....C. Hartley et al
Elevator lock.....M. Dashiell
Elevator safety attachment.....D. Pamp
End gate. Vehicle.....A. Bern
Engine.....G. E. Whitney
Engine.....W. Germinier
Engine fly wheel.....G. W. Schultz
Engine using a mixture of air and steam as a motive fluid. Locomotive and other E. Field
Engines. Mud lug for wheels of traction.....P. Totems
Engravers' blocks. Pin for.....J. C. Martin
Envelope.....M. H. Owens
Envelope fastener.....E. B. Stimpson
Eraser pad cleaner.....E. M. McNamara
Excavating apparatus.....W. J. Newman
Excavating apparatus. Power transmission for.....W. J. Newman
Excavating machine. Tunnel.....G. W. Jackson
Explosive engine. Four cycle.....H. Kastrop
Explosive. High.....W. S. Winchester
Explosive substances. System for the utilization of heat and power from highly.....J. D. Tejada
Extension table.....C. E. Nash
Fabric cutting machine.....W. Corman
Face guard.....A. J. Paronbek
Fan attachment.....B. A. Breyer
Fan. Centrifugal.....R. Hancock et al
Fasteners or clamps. Apparatus for making metal.....T. Remms
Feeder or conveyor.....N. B. Converse
Feeding device.....G. Halliday
Feeding or medicine cup.....C. A. Tatum
Fence post.....S. M. Reese
Fence. Wire.....A. F. Elsey
Fence wire stretching device.....E. E. Ostlund
Feeder.....L. L. Tackitt
Filing box.....J. Marshall
Filing machine.....C. L. Bastian
Filter.....J. T. H. Paul
Fire extinguisher. Hand chemical.....O. J. Childs et al
Fire alarm.....E. Bucciet al
Fire extinguisher supervisory system. Automatic.....J. G. & J. D. Nolen
Fire protection system.....J. G. Nolen
Firearm.....K. von Pucci
Firearm.....J. E. Nelms
Firearm breech protector.....O. C. Edwards
Firearm sight.....J. Windridge et al
Fireplace attachment.....J. R. Day
Fireproof and fire resisting putty. Composition of matter for.....J. Marx
Fireproof Christmas tree.....F. L. McGahan
Flowers. Apparatus for manufacturing artificial.....L. Shogran
Fluid pressure motor.....L. Bondreux et al
Flushing apparatus. Closet.....W. Kesselring
Flying machine.....W. H. Cook
Folding chair.....G. H. Strand
Fork and analogous implement.....S. J. Large
Fork or grapple.....H. H. Millis et al
Full stroke mechanism.....H. Hopkins
Funnel for fruit packing machines.....N. B. Converse
Furnace.....W. J. Hatcher et al
Furnaces. Method of and means for charging electric.....W. H. Huffman
Furrow opener, fertilizer distributor, lister, and bedder. Combined.....W. C. Lynham et al
Fuse for projectiles.....S. D. Cushing
Fuse. Safety.....F. Opredenk
Fuses. Setting tool for.....L. Hanschild
Game ball.....S. E. Wharton
Garter.....F. F. Knothe
Gas. Apparatus for the manufacture of.....J. S. Smith
Gas generator. Acetylene.....E. M. Rosenbluth
Gas generator. Acetylene.....F. P. Cave
Gas generator. Acetylene.....L. H. Hallam
Gas mantles. Machine for firing incandescent.....H. Heidorn
Gas producing apparatus.....J. S. Smith
Gas regulator for burners.....C. F. Gaffney
Gas retort.....G. T. A. Jerratsch
Gate.....J. Sutherland
Gear. Reversing.....E. G. Smith
Gear. Reversing.....W. Wallace
Gear. Transmission.....W. W. McFarren
Glass. Method and apparatus for drawing sheet.....I. W. Colburn
Glass press.....E. J. Hayes
Goods. Folding board for dress.....G. D. Clintsman
Grain guard.....M. Molitor
Graphophone sound box.....J. F. Murray
Grate.....2 pats. P. B. Hartford
Grate.....A. B. Clunies
Grindstone operating device.....T. F. Hopkins
Gun cleaner.....P. E. Aird
Gun. Portable.....O. Lanber et al
Guns. Lever actuated wedge breech mechanism for.....M. Hermsdorf
Gymnasium apparatus.....G. C. Berglund
Handling goods. Means for.....A. E. Platt
Harmonica support. Pipe.....S. Keeler
Harrow and corn planter. Combined.....T. H. Sparks
Harvester picker stem. Cotton.....G. Lisperard
Harvester. Sugar cane and corn.....E. B. Stafford
Basp.....S. B. Phelps
Hat stud.....H. W. Speight
Hay press.....C. W. Deaton
Hay press.....W. P. Moore
Hay rake. Self dumping.....A. H. Hogen
Headlight. Electric arc.....J. Kirby, Jr
Hinge. Butt.....C. Winkler
Hoe.....H. McChesley
Holder.....F. L. Lyman
Hook.....W. D. Ziegler
Hook and eye.....H. N. Legan
Hop jack.....G. E. Laubenheimer
Horn snapper.....A. H. Jones
Horse detacher.....J. A. Fennell
Horse shoe attachment.....A. H. McLachlan
Horse shoe calk. Removable.....S. L. Dunlap
Hose coupling.....C. C. Corlew
Hose coupling. Gravity.....E. E. Gold
Hose nozzle.....G. Pecover
Hub. Vehicle.....T. J. Reid
Hydrant.....G. H. Traxel
Hydrocarbon burner.....2 pats. B. Clarke
Hydrocarbon burner.....A. W. Gearhart
Ice from rails. Device for removing.....J. W. Blacksten
Ice from trolley wires. Means for removing.....C. E. Atkinson
Igniters. Starting means for incandescent.....J. S. Lang
Inhaler.....J. W. Horner
Insect trap.....B. J. Mattingly
Interlocking mechanism.....A. J. Gillespie
Internal combustion engine.....J. Gunther
Ironing board.....G. W. Forney
Iron closure.....J. R. Shearman
Jewel mounting.....H. W. Fishel
Journal box.....S. S. Conant
Journal box for railway cars. Pressed steel.....W. H. Shinn
Journal box lubricator.....F. B. Harrison et al
Keyboard.....F. Kuba
Kneading and bailing machine. Dough.....R. M. Temple
Knee brace.....C. D. Messersmith
Knob attachment.....M. E. Welch et al
Labeling machine.....K. Otting
Ladder. Store service extension.....F. E. Scott
Lamp and connection therefor. Electric incandescent.....W. J. Phelps
Lamp bracket. Electric.....F. H. Lohrs
Lamp bracket. Miner's.....C. C. Kelly
Lamp extinguisher.....C. Bergner
Lamp holder.....W. J. Phelps
Lamp socket.....R. Rowley
Lamps of high efficiency. Arrangement of the filament for high voltage incandescent electric.....C. Glogau
Lens case.....F. A. Stevens
Laundry marking machine.....C. A. Bunker
Lawn sprinkler.....C. C. Cheney
Life saving garment.....T. F. Hoyt
Lifting jack.....M. E. Davis
Lifting jack.....A. Van Fleet
Lightning arresting switch.....W. D. Shirk
Line spacing mechanism.....W. W. Hopkins
Liquid fuel burner.....W. Dieckmann et al
Liquid level indicating gage.....C. Cuno
Liquid or semiliquid mixer.....E. G. Holden
Liquids to surfaces. Apparatus for applying.....I. Binks
Lock.....J. Phillips
Lock protecting device.....C. F. Leighton
Locomotive.....C. L. Nilson
Locomotive pilot.....2 pats. B. T. Hamilton
Loom picker motion.....H. Griffin
Loom shuttle.....C. J. Sullivan
Loom shuttle changing mechanism.....C. F. Perham
Loom shuttle check.....P. Macpherson
Loom weft replenishing mechanism.....C. F. Perham
Lung tester. Trick.....E. M. Coghlan et al
Machine operating mechanism.....C. R. Meston
Mail bag fastener.....G. T. Barr
Mail receiving and delivering apparatus.....H. G. Robinson
Malt extracts rich in diastase. Making.....G. Sobotka
Mandolin.....W. C. Clopton
Mangle.....E. G. Smith
Mantle holders. Dies for.....B. H. Greene
Mantle support.....F. B. Howard
Massage apparatus.....J. C. Barnes
Measuring machine. Cloth.....J. E. Windle
Mechanical movement.....H. M. Russell, Jr
Metal coated articles. Apparatus for cooling and finishing.....E. S. Mowry
Metal shears.....W. A. Thompson et al
Meter.....D. E. Scraftford
Meter slip holder.....G. E. Hawkins
Milk powder. Manufacture of.....M. Riegel
Milling machine.....J. E. Key
Miner's lantern holder.....T. R. Jones
Mining machinery. Coal.....A. H. Gibson
Miter box.....W. J. Connolly
Mixing machine.....A. J. Cropp
Mixing machine.....R. Hohnbach
Money order cabinet.....W. B. Henderson
Motion. Transmitting.....J. F. Pagendam
Music roll holder.....G. H. Davis
Musical instrument. Stringed.....C. H. Inskeep
Necktie fastener.....A. Swanson
Necktie retainer.....W. A. Lord
Nest. Hen's.....W. Airhart
Note sheet guide mechanism.....F. W. Wood
Nut lock.....2 pats. D. R. Hillman
Nut lock.....J. A. Townsend
Nut lock.....C. H. Warren
Nut lock.....W. K. Lees
Nut lock.....S. A. Zeller
Oil burner. Fuel.....F. Smith
Oil can.....H. C. Beman
Oil car for handling fires.....C. Weinel
Ore concentrator.....J. C. Tatman
Outlet box.....W. H. Colgan
Oven. Bake.....A. E. Sydam
Oven. Baker's.....M. Richard et al
Oven. Baking.....E. M. Dixon
Packing. Steam turbine shaft.....C. V. Kerr
Packing. Steam turbine shaft.....J. L. Moore
Pad.....J. L. Scott
Paddock.....P. C. Ryan
Pants protector.....M. E. L. Bergen
Paper and producing same. Manifold.....E. E. Linfoot
Paper bag machine.....3 pats. W. A. Lorenz
Paper fastener.....L. B. Ware
Paper feeding mechanism.....S. M. Hawley
Paper tube caps. Making.....C. F. Jenkins
Paring machine.....O. W. Brenizer
Paring machine. Apple.....W. H. Hills
Pedestal table.....H. C. Schneider
Pen. Drawing.....J. R. Schumacher
Percolator.....2 pats. A. A. Warner
Permutation lock.....P. Hudson
Petroleum burning apparatus. Crude.....J. F. Stafford
Petroleum. Burning crude.....J. F. Stafford
Phonograph starting and stopping mechanism.....C. H. Wilkes et al
Photographic printing machine.....S. Colfax
Piano playing mechanism. Automatic.....P. Wuest, Jr
Piano violin.....C. L. Flint
Picker.....D. Martin
Pie crust forming machine.....O. Colborne
Piling. Interlocking means for sheet.....G. E. Nye
Pin tongue.....G. W. Dover
Pinion. Roller.....R. W. Ellingham
Pine. Self locking cannon.....S. O. Henseth
Pipe cutter.....D. Forsberg
Pipe fitting. Soil.....W. Mout
Pipe nipple blank holder.....J. Yule
Pipes and tubes. Manufacture of compound.....J. W. Offutt
Planing machine.....W. Holthaus
Planter.....W. Boyer
Planter. Potato.....H. Remmers
Plants placed in rows or single. Device for binding up.....E. Dorner
Plow.....C. W. McWane
Plow.....J. R. Davidson
Plow. Rotary.....C. J. Cunningham
Plowshare.....A. Lindgren
Plug seat switch.....E. E. Yaxley
Plug switch.....E. C. Eldredge
Poke. Animal.....M. M. Seay
Potato cutter and planter. Combined.....J. J. Putney
Potato digger.....J. J. Putney
Power transmission mechanism.....G. Cornilleau
Power transmitting mechanism.....Z. B. Starr
Preserving fresh ripe olives.....E. L. N. Bedford
Press plate.....2 pats. A. W. French
Pressure gage signal.....J. B. Townsend
Printers' leads. Machine for distributing.....2 pats. G. H. Ward
Printing machine.....W. M. Bacon
Printing machine.....E. Z. Taylor
Printing press. Single revolution rotary.....W. K. Hodgman et al
Printing press. Two color.....W. K. Hodgman et al
Printing presses. Roller for platen.....J. H. Schussler
Protease preparation. Making.....K. Schwickerath
Pulley frame.....L. Zamboni
Pulley. Separable.....D. T. McNeil
Pump.....E. E. Slick
Pump. Piston.....J. Sjoström
Punching machine. Plate.....E. W. Summers
Radiator attachment.....J. C. Schenning
Rail and clamp. Guard.....W. C. Roswell
Rail clamp. Guard.....W. C. Roswell
Rail joint.....J. A. Bridge
Rail splice.....B. B. & T. W. Bonner
Railway. Pleasure.....R. Mega
Railway rail joint.....W. H. Rothermel
Railway signal.....A. Hauty
Railway signaling.....W. T. Oviatt et al
Railway spike.....H. D. Spike
Railway tie. Metallic.....M. R. Kramer
Railway time table and bulletin board. Interchangeable.....J. H. Pennick
Railway track construction.....H. B. Nichols et al
Rake attachment.....C. C. Bergh
Receptacle for small articles.....J. C. Diamant
Reel.....C. A. Brinley et al
Revolver.....M. Stern
Revolving stand.....I. N. Davis
Rotary engine.....W. H. Marsh
Rotary engine.....W. L. Ripscm
Rotary engine.....I. Kleckner
Rolling machine. Paper.....W. H. Jordan
Safety pin.....H. M. Fetters
Sandpapering machine.....J. Gramspercher
Sanitary pad.....W. E. Wright
Sash fastener. Window.....C. W. Robison
Sash fasteners. Bumper for.....A. H. Anstey
Sash lock.....E. F. Henderson
Sash operating mechanism.....J. L. Best
Saw filing machine.....T. C. Holsclaw
Saw set.....J. H. Wagner
Sawing machine.....C. A. Kallstrom
Sawing machine.....T. R. King
Scfold.....F. R. Dudley
Scale.....C. H. Hapgood
Scraper. Dirt.....A. C. Fields
Seat.....A. B. McLean
Seeding machine.....3 pats. C. P. Sester
Seeding machine attachment.....C. P. Sester
Separation. Electrical.....H. A. Wentworth
Separator.....J. S. Evan
Sewer pipe.....E. L. Maag
Sewing machine attachment.....H. E. Schmitz
Sewing machine binder.....C. F. Gray
Sewing machine edge folder guide.....A. Laubscher
Sewing machine. Hat.....H. A. Blanchard
Sewing machine needle guard.....R. S. Hiltmann
Sewing machine take up.....E. C. Ives
Sewing machine tuck folder.....A. Laubscher
Shaft collar.....J. R. Grundy
Shafting. Flexible.....W. H. Church
Sharpening machine. File.....C. M. Emerson
Shearing and pressing machine.....J. Becker
Shingle packing frames. Counting attachment for.....J. H. Collins
Ships by submarine explosions. Means for preventing the destruction of.....H. Hoyoss
Shock binder.....A. L. Smith
Shoe. Base ball.....D. J. Golden
Sign.....A. A. Albright
Sign. Illuminated.....H. Dreyer
Signal apparatus. Automatic torpedo.....F. T. Forbes et al
Signal drop.....H. J. Heeney
Signaling device. Fog.....E. P. Donnelly
Signaling system. Automatic.....I. Kitsee
Siphon. Automatic double finishing.....C. H. Linn
Slack adjuster.....8 pats. A. Parker-Smith
Slack adjuster.....W. H. Sanvage
Sleigh knee.....J. B. Hennemann
Smelting. Pyritic.....H. Arden
Snap hook and chain link. Combined.....A. P. Heidt
Snow guard.....F. Frank, Jr
Snow shovel.....J. Gifford
Sock or stocking.....A. Poetzl
Soldering device.....H. F. Pool
Speed recording instrument dial.....E. A. Henkle
Spinning and twisting apparatus.....R. L. Cummock
Spring device.....W. B. Rueckert
Stacker. Hay.....P. F. & C. A. Fleming
Stage curtain.....J. W. Vogel
Stamp mill.....P. N. Leveque
Starch washing apparatus.....W. H. Unland
Stave jointing machine.....J. Simmons
Steam boiler.....P. C. Fordard
Steam engine.....J. W. Tewksbury et al
Stitch impression finishing machine.....J. J. Heys
Stitch impression machine.....J. J. Heys
Stocking supporter.....L. G. Hanley et al
Stoneworking tool.....D. W. McLeod
Stool. Folding camp.....T. O'Brien
Storage apparatus for coal, &c.....C. A. Fry
Storage battery.....W. Gardiner
Store front and show case construction.....F. J. Plym
Stove.....M. Kelly
Stove. Heating.....R. F. Voorhis
Stoves. Chimney valve for hot blast.....W. F. Rust
Stovepipe cleaner.....H. O. Sholdebrand
Structure. Adjustable.....F. W. Coy
Substation protector.....F. B. Cook
Supporting plate.....S. H. Summerscales
Surface gage.....T. Evans
Surface material to bodies. Apparatus for use in applying.....J. R. & A. Wells
Suspenders. Cast off for.....R. F. Bartel
Sweeper. Pneumatic.....S. Buder
Switch.....D. M. Bliss
Switch operating mechanism. Electric.....J. M. Andersen
Table.....H. P. Arnt
Talking machines. Adjustable reproducer arm for.....W. C. Runge
Tape reel.....W. L. E. Kerffel
Tattooing dies. Manufacturing.....H. A. Jones
Telegraph or electric wire pole.....S. H. Summerscales
Telegraphy.....2 pats. I. Kitsee
Telegraphy. Constructing antennae of wireless.....J. Murgas
Telegraphy. Ship's.....R. D. White
Telephone attachment.....A. H. Berg
Telephone attachment.....E. S. Maddock
Telephone system.....D. H. Wilson
Telephone transmitter mouthpiece guard.....G. E. Grimm
Thermometer case. Clinical.....F. R. Hart
Thill. Sleigh.....M. D. Schaller
Tires. Apparatus for molding crescent fillers for.....W. F. Stearns
Tires. Means for indicating the deflation of.....H. B. Williams
Tobacco rack.....A. S. Botkin
Tool.....E. Kropat
Tool attachment.....N. C. Christensen
Tool. Combination.....G. L. Blair
Tool. Combination.....E. Moat
Tool guide.....H. F. Libby
Track channeler. Electro pneumatic.....A. H. Gibson

Traction wheel.....C. M. Bell et al
Train stopping device.....G. J. Gumm
Transmission mechanism.....F. J. Pond
Trestle, Adjustable.....C. H. Thomas
Trolley harp.....C. E. Atkinson
Trolley stand.....J. H. McPherson
Trolley wire hanger.....W. G. Clark
Truck, Car.....W. E. Symons
Truck structure.....W. E. Symons
Trunk.....H. Davis
Trunk.....J. H. Wienand
Trunk tray support.....W. H. A. Stout
Tube cleaner.....F. W. Canales
Turbine.....W. B. Sayers
Turbine, Elastic fluid.....C. G. Curtis
Turbine, Steam.....T. F. Sheridan
Twyer.....J. F. Flewelling
Type writer cylinder.....E. Noguera
Typewriting machine, 2 pats.....H. W. Merritt
Typewriting machine.....W. W. Hopkins
Typewriting machine.....H. W. Merritt
Typewriting machine.....R. H. Strother
Typewriting machine.....W. W. Hopkins
Typewriting machine.....R. D. Parker
Typewriting machine.....J. Felbel
Typewriting machine carriage stop.....W. W. Hopkins
Typewriting machine ribbon feeding mechanism.....W. W. Hopkins
Umbrella handle coupling.....C. Marx
Uterine supporter.....W. T. Baird
Valve.....C. J. Jackson
Valve, Check.....J. A. Cuneo
Valve, Check.....H. Daniel
Valve, Feed.....B. H. Jeffries
Valve for gas engines.....P. Schwem
Valve gearing.....J. F. Meyjes
Valve, Piston throttle.....M. Christman et al
Valve, Quick opening.....J. P. Lavigne
Valve, Reducing.....H. F. Cunniff
Varnishing composition and making same.....K. Goldschmidt
Vault, Burial.....W. A. Hazelbaker
Vault, Grave.....W. A. Crew
Vaults, Constructing cement burial.....S. W. Beckwith
Vehicle.....S. D. & H. T. Latty
Vehicle controller, Hydraulic.....J. W. Anderson
Vehicle driving clutch, Mechanically propelled.....T. B. Jeffery
Vehicle, Motor.....G. E. Whitney
Vehicle motor attachment.....E. Hopper
Vehicle numbering device.....A. Baizer
Vehicle snow shoe attachment, Wheeled.....N. Minster
Vehicle top support.....A. H. Gurley et al
Vehicle wheel.....J. H. Forrest
Vehicles, Fore carriage for.....W. G. Hughes
Vending machine, Coin controlled.....J. C. Wilson
Ventilating apparatus.....D. L. Ellis
Ventilating device.....L. S. Graebing
Vessel, Metallic.....L. O. Brown
Vessel, Transport.....O. Mehrtens
Vise.....R. W. Parker
Vise, Pipe.....D. L. Ellis
Wagon, Dumping.....W. J. Donnelly
Wagon, Dumping.....H. S. Palm
Wall structure.....W. P. Francis
Walls and neutralizing saltpeter therein, Construction for drying.....M. Leser
Washing machine.....W. A. Lee
Watch case bow.....A. Milne
Water back shield.....S. M. Stevens
Water closet.....E. Hamman et al
Water closet apparatus.....E. Hamman et al
Water closet tank valve.....C. Pfau
Water for irrigation, &c., Self-regulating apparatus for delivering.....A. S. Gibb
Water meter installations, System of controlling valves for.....C. Meinecke
Water pressure piston engine.....H. B. Meier
Wave motor.....J. Birch
Weather strip.....H. Kean
Wedge.....H. H. Blake et al
Wedge, Ax and tool handle.....G. P. Morrill
Weighing mechanism, Automatic.....G. A. Lee
Well casing shoe.....R. C. Baker
Wheel.....J. Hippisley
Wheel flange lubricator.....J. H. Miner
Wheel mounting, Vehicle.....C. W. Fulton
Whistle tree hook.....C. W. Blackburn
Whist tray.....A. W. Hobson
Windmill regulator.....J. B. Vail
Windmills, Automatic cut out for.....J. Roesler
Window, Casement.....I. Wroblewski
Window platform, Adjustable.....C. E. Balbach
Window screen.....B. Worthington
Wire stretcher.....M. E. Johnson
Wood with paraffin, Method of and apparatus for treating.....J. Binks
Wrappers around rectangular tablets, Machine for folding.....F. Grover
Wrapping machine.....L. C. Wing
Wrench.....R. O. Daniel
Wrench.....T. T. Hurd
Wrench.....J. F. Lynn

DESIGNS.

Automobile body.....J. D. Maxwell
Ash can or garbage vessel.....T. Lee
Car seat end frame.....E. G. Budd
Fabric, Woven.....W. K. Smith
Furniture ornament, 2 pats.....C. V. Holstein
Glass vessel.....R. Haley
Hand bag.....H. Grossman
Mandolin body.....W. C. Stahl
Paper, Wall.....J. Wishart
Shade or globe, Artificial light.....K. Booth
Spoon.....G. B. Ludy
Spoon.....J. W. Brereton
Spoons, forks, or similar articles, Handle for.....H. Hillbom
Watch dial.....C. W. Schelder
Water heater.....J. M. Tobias

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Abrading apparatus.....J. L. Newell
Acid chamber, Sulfuric.....O. H. Ellet
Adding machine.....W. B. Herbert
Aerial navigator.....F. M. Mahan
Air brake coupling, Automatic.....T. B. McMillan

Air brake system.....A. A. St. Clair
Air brake system, Elevator.....A. H. Meech
Air compressor.....W. Reavell
Air compressor.....J. F. Davidson
Air ship.....C. L. Buckwalter
Anchor bolt.....I. Church
Annealing furnace, Electric.....A. L. Marsh
Automobile.....H. L. Ide
Automobile weather front.....A. J. Krower
Axle, Vehicle.....M. W. Heyenga
Bag frame, Muff.....J. F. Bieda
Bag holder.....S. B. Darham
Baling machine.....S. B. Martin
Basket construction, reissue.....D. H. Ryan
Battery can or receptacle, Storage.....T. A. Edison
Bearing, Roller.....W. S. Sharpack
Bed.....W. H. Cling
Bed, Folding.....A. C. Thew
Bed, Folding twin.....G. E. Reed
Bed support, Folding.....M. R. Rodrigues
Bedstead, Convertible.....W. H. Richards
Beehives, Combined bottom board and feeder for.....E. T. Cary
Beer pipes, Cleansing liquid for.....H. C. Stiefel
Bell Electric.....C. C. Cadden
Bill board.....J. M. Goller
Billiard cushion.....O. E. Smith
Binder, File.....J. C. Dawson
Binder, Loose leaf.....W. S. Proudft, Jr.
Binder, Loose leaf.....J. H. Perkins
Binder, Temporary.....F. B. Jordan
Blind furnace.....J. W. MacDonald
Blind slat tenon.....O. H. Chandler
Block molding apparatus.....W. M. Scott
Block signal system.....E. F. Bliss
Boat.....W. J. Nolan
Boat, Bicycle.....L. P. Hill
Boat, Life.....C. W. Weiland
Bobbin and spindle, Combined winding.....E. Atwood
Bobbin holder.....J. Pearson
Bobbin holder.....T. J. Murdoch
Bobbin machine.....A. Braun
Boiler.....O. U. & J. W. Chenoweth
Boiler.....C. E. Chapman
Boiler cleaner.....E. H. Reiter
Boiler safety device.....G. E. Whitney
Book for library shelves, Dummy.....F. E. Conter
Book holder.....E. B. & F. A. Taylor
Book leaf holder.....S. S. Potter
Bottle capping machine.....H. S. Brewington
Bottle carrier for bottling establishments.....M. W. Norkewitz
Bottle case.....F. J. Sobor
Bottle closure.....I. C. Dilks et al
Bottle closure.....F. W. H. Clay
Bottle, Non refillable.....W. L. Peffey
Bottle stopper.....M. Ryan
Bottle stopper, Water.....M. C. Schweinert et al
Box filling machine.....A. L. F. Mitchell
Box lid holder.....H. E. Feldman
Box machine.....G. A. Barnes
Brake beam fulcrum and manufacture.....E. I. Dadds
Brake gear, Hydraulic.....L. J. Creclius
Brake mechanism, Fluid.....W. H. Daily
Brake slack adjuster, Automatic.....R. F. Hamilton
Braking device.....V. Lamb
Bread cutter.....W. H. Keeler
Broiler.....S. S. Eccleston
Broom hanger.....B. Clark
Brush blocks, &c., Machine for boring.....C. E. Flemming
Brush, Tooth.....G. Strassburger
Buckle.....J. W. Gonce
Building construction material.....G. M. Marshall
Bulletin board.....S. J. Connies
Buttonhole.....P. Weiss
Cabinet, Kitchen.....H. Harrild
Calibrating device.....C. H. Hill
Cap and manufacturing same, Apparel.....N. E. Kahn
Car and the like, Transportation.....T. R. Brown
Car body.....E. I. Dadds
Car buffer.....D. E. Thompson
Car construction, Passenger.....A. H. Sisson
Car door, Grain.....W. H. McMachen
Car draft rigging.....G. W. Nye
Car, Dumping.....E. I. Dadds
Car grip.....F. B. Wentworth
Cars, Compound dumping hinge and automatic door bar for ore.....W. C. Matteson
Cars, &c., Skid for baggage.....W. Leach
Carbureter.....F. E. Bowers
Carbureter for oil engines.....G. Enrico
Carpet sealer, Stair.....W. B. Waugh
Carpet stretcher.....F. Richardson
Carriage seat, Auxiliary.....D. S. Staebler
Cartons and the like, Machine for folding and tucking.....F. M. Peters et al
Cartridge, Blasting.....O. T. Finch
Cash register.....C. Leni
Cash register.....J. H. McCormick
Cask making machine.....J. Gilmour
Caster for drying racks for shoe factories.....I. E. Fletcher
Cathode.....H. S. Hatfield
Cellulose, Manufacturing nitrated.....A. Voigt
Cement and manufacturing the same, Portland.....T. A. Edison
Cement burning method and apparatus.....T. M. Morgan
Centrifugal machines, Overhanging device for.....J. M. Cornell
Channel flap layer.....W. H. Hooper
Chimney construction.....H. R. Heine
Chimney cow or ventilator.....A. C. Badger
Chuck.....P. Zulinke et al
Chuck, Drill.....F. E. Kling
Chuck, Jeweler's lathe.....C. F. Hornbeck
Churn.....A. Bial
Chute, Trimming.....P. O. Olson
Circuit closer.....F. R. Wickwire
Clip fastener.....C. R. Snead
Clothes rack.....A. J. Keegan
Clutch, Friction.....A. E. Gagnon
Clutch, Friction.....J. W. Leonard et al
Coat adjuster.....A. E. Gagnon
Coin.....J. Donahue
Coin assorter and stacker.....B. F. Brewster
Coins, Machine for counting, registering or otherwise handling.....W. W. Broga
Collapsible box.....R. P. Brown
Collar stiffening device.....S. H. Tolman
Combination wrench.....E. M. Walters
Compass board.....H. Rigby

Commutator assembling, Jig or form for.....J. H. Genor
Composition.....J. H. Wilson
Composition of matter.....A. S. F. Lohmann
Concentrator.....H. E. Horn
Contact pole retriever.....J. F. Mackin
Control system.....G. H. Hill
Controller, Automatic.....A. E. Osborn
Controlling switch.....H. E. White
Conveying apparatus.....E. N. Trump
Cooker, Fireless.....C. W. Reynolds
Copying roller, Press.....H. Spingler
Copying rollers, Moistener and casing for.....H. Spinger
Corn popper handles, Means for protecting.....C. D. Eymann
Cotton chopper.....J. M. McCoy
Coupling pin.....J. C. Yeiser
Couplings, Machine for recessing.....W. C. Reilly
Cover, Vacuum receptacle.....W. Haaker
Crimping mechanism.....R. B. Ware
Crockery handle, Detachable.....H. F. Fowles
Crushing and pulverizing machine.....W. J. Bell
Crushing machinery.....T. J. Gray
Cue.....W. H. Bucknum
Cultivator.....M. H. Nicholson
Cultivator.....J. M. Pearson
Cuvert, Corrugated metal.....C. D. Voris
Current machine, Alternating.....M. C. A. Latour
Current motor, Alternating.....E. F. W. Alexanderson
Current motors, Controlling alternating.....C. P. Steinmetz
Curtain fastener.....C. E. Chamberlin
Cuspidor.....N. N. Cherry
Cuspidor.....M. E. Chamberlain
Cut out, Automatic.....G. E. Eastham
Desk attachment.....A. S. Baylor et al
Diffusion apparatus.....F. von Klauy et al
Dish drainer.....H. T. Hughes
Dish washer.....C. O. Hescoc
Display device.....F. W. Chamberlain
Ditch cleaning shovel.....R. A. Goggin
Ditching machine.....J. S. Blackie
Door construction, Sliding.....S. A. Baker
Door hanger.....J. H. Burkholder
Doughnut cutter.....A. E. Baum et al
Draft equalizer.....N. A. Rodness
Draft rigging.....J. E. Muhlfeld
Draper fixture.....T. F. Byron
Drawer guide.....G. D. Barr et al
Dress shield.....H. D. Hardcastle et al
Drinking fountain, Poultry.....T. Bischoff
Dust pan.....A. W. Shank
Dust removing pneumatic machines, Suction device for.....J. R. Blum
Dyeing or printing in shaded colors or tints, Color feeding attachment for machines for.....M. Becke
Dynamo construction.....H. Leltner
Dynamo Unipolar.....W. Mathieson
Electric conductor.....C. E. Eveleth
Electric induction furnace.....J. Harden
Electric machine, Dynamo.....R. B. Williamson
Electric machine, Dynamo.....A. C. King
Electric machine, Dynamo.....E. F. W. Alexanderson
Electric meter.....W. J. Mowbray
Electric motor, dynamo and the like, Moisture proof.....F. W. Ellis
Electrical connection.....P. Horan
Electrical distribution system.....J. W. Achard
Electrical lugs, Making.....G. A. Tower
Electrogalvanic apparatus.....F. F. Hespe
Electrolysis.....G. Rambaldini
Engine sparking device, Explosive.....W. A. Vause
Engine with rotary cylinders.....M. Bucherer
Engines, Crank case and bearing for explosive.....H. E. Coffin
Envelope machine.....L. Marcell
Excavating machine, Gravel.....E. Ulrey
Explosive and making the same, High.....F. B. Holmes
Eyeglasses or spectacles.....G. F. Applegate
Fabrics, Machine for rubbing narrow.....H. Simonin
Face cover.....M. F. Dobbins
Farm gate.....M. Loomis
Fastening device, Separable.....J. A. Lewis
Feed boxes, Time operated mechanism for.....J. W. Cable
Feeder for pigeons, squabs or birds.....C. Wentzien
Ferrosilicon, Producing.....E. F. Price
Fibrous composition, Vulcanized.....J. W. Kumph
File.....F. N. Gilbert
File cabinet.....B. H. Jeffers
Filing devices, Attachment for paper.....P. H. Yawman
Filing drawer and compartment.....H. O. Brigham
Filtration and water supply system.....F. Grote
Fire alarm, Pneumatic.....W. Wadsworth
Fire extinguisher.....J. L. Williams
Fireproof buildings, Partition for.....B. J. Kahn
Fireproof partition and furring.....A. Priddle
Fish bait or lure.....J. J. Heddon
Flower pot, Knockdown.....C. U. E. Norum
Fly screen.....T. Norum
Fodder cutter.....F. G. Harrison
Fodder tie, Corn.....F. Bullinger
Form and arm pad, Combined bust.....D. Harrison
Freezing machine.....J. B. Schafer
Fudge box.....J. J. Clause
Fumigator.....M. R. Fuller
Furnace.....M. V. Smith
Furnace regulation.....G. W. Goehns
Furnaces, Automatic slip return pipe for blast.....A. J. Fulton
Game.....D. H. Martin
Game apparatus.....C. H. Lee
Game box.....M. J. Howlett
Garment fastener.....A. B. Reid
Gas engine.....E. Franklin
Gas engine.....2 pats.....N. Crane
Gas scrubber.....E. F. Lloyd
Gate.....J. W. Johnson
Gate opening and closing device.....D. A. Lee
Gearing.....H. C. Shaw et al
Gearing, Frictional.....J. Gomborow
Glass for counting picks or threads in fabrics.....J. S. Yergason
Glass, Producing opalescent.....J. I. Arbogast

Glazier's point.....W. H. Jones
Go-cart, Folding.....W. C. Bull
Gopher trap.....J. A. Hell
Grain drill attachment.....S. W. Rowell
Grain graders or like machines, Screw roller for.....H. W. Maxwell
Grinding mill.....M. F. Abbe
Grinding mill.....W. R. Cunningham
Gum purifier.....C. T. Hamilton
Gun, Air.....W. F. Markham
Gun trap.....W. Klespies
Gutter attachment, Rain.....L. H. De Limon
Hammer, Drop.....O. S. Beyer
Harrow scraper, Disk.....A. L. Moen
Harrow sulky attachment.....C. S. Sharp
Harvester, Beet.....M. Goodfellow
Harvester, Grain.....H. J. Case
Heating boiler.....H. P. J. Earnshaw
Heating method.....F. A. Simonds
Heel compressing machine.....F. Raymond, 2d
Heel nailing machine.....G. M. Pettengill
Hee spring.....G. E. Swan
Hinge, Chair back.....O. P. Breithat
Hoisting apparatus, Expansion drum for.....D. W. Driscoll et al
Hoof cutter.....A. Looch
Hook.....C. A. Nauman
Hooping casks and the like, Machine for.....E. W. Whiteman
Horn support, Amplifying, reissue.....A. S. Marten
Horseshoe.....R. E. L. Humphreys
Horseshoe.....A. Kwikkel
Hot water furnace.....H. L. Bruce
Hub, Wheel.....B. F. Powell
Hydraulic motor, Reciprocating.....E. Heidmaier
Hydraulic press.....W. Astfalck
Hydraulic press.....A. Schwiager
Hydrosulphite mixture and making same, Stable.....W. Msjert
Hydrosulphites, Production of stable, dry.....M. Bazlen
Indigo, Making.....N. Caro
Ink well.....J. B. Randolph
Insulation to electric conductors, Apparatus for applying, 2 pats.....L. W. Downes
Insulator and support for electric lines.....T. Varney
Insulator for electric lines, Strain.....T. Varney
Insulator, Strain.....T. Varney et al
Insulator, Strain.....C. Aalborg
Insulator, Strain.....H. P. Davis
Iron oxides, Reducing.....H. W. Lash
Ironing and shaping machine, Collar.....A. T. Cox
Ironing table.....C. Zimmerman
Jar cover, Metallic.....J. P. Lyon
Key lock, Multiple.....J. Roche
Kitchen table.....E. C. Pitcher
Knitting machines, Mechanism for operating special needles in.....E. A. Hirner
Label applying machine.....W. W. Bradbury
Lactates, Manufacturing.....A. A. Clafin
Lamp, Denatured alcohol gas.....G. H. Schroeder
Lamp, Gas.....A. H. Humphrey
Lamp, Sectional incandescent.....G. E. Bill et al
Lamp socket, Electric.....T. H. Hill
Lamp, Therapeutic.....H. E. Coger
Lamps, Machine for making stems for incandescent.....J. W. Howell et al
Lathe.....P. Krepp
Lead cutters, Gage attachment for.....G. M. Durell
Ledger clasp, Loose leaf.....J. L. Taylor
Lenses, Forming.....W. I. Seymour
Letter sheet and envelop, Combined, reissue.....J. T. H. Mitchell
Letters and the like, Machine for folding.....O. W. Johnson
Level glass.....J. W. Plimpton
Lightning arrester.....W. J. Meyer
Lightning arrester.....C. P. Steinmetz
Liquid fuel feeding system.....G. E. Whitney
Liquid separators, Liner for centrifugal.....W. W. Marsh et al
Liquids, Separating the moisture from the constituent solids of.....L. C. & I. S. Merrell et al
Lock protecting device.....C. E. Leighton
Locomotive.....J. W. Finch
Locomotive driving boxes and driving wheel hubs, Lubricating device for the surfaces of.....M. Millett
Locomotive driving boxes, Lubricating device for the surfaces of.....M. Millett
Loom.....G. F. Hutchins
Loom filling replenishing mechanism.....B. Janelle
Loom picker check.....W. H. Ayer
Loom shuttle motion.....H. L. Goodwin
Loom warp stop motion.....J. K. Lanning
Loom warp stop motion.....C. D. Lanning
Loom warp stop motion.....J. K. Lanning
Looms, Lever moving mechanism for.....W. M. Wattle
Looms, Weft carrier for weft replenishing.....M. L. Stone
Mail bag catching and delivering device.....C. R. Yeager
Manifolding device.....L. Winkelmann
Mask, Catcher's.....J. Gamble et al
Massage apparatus, Abdominal.....J. C. Johansen
Mattress frame.....H. A. Bacon
Measure, Tailor's.....R. Thompson
Metal bars, Machine for clearing.....H. Muller
Metal bodies, Apparatus for producing compound.....J. F. Monnot
Metal cutting machine.....H. John
Metals and compositions used therein, Manufacturing.....H. Goldschmidt et al
Metals, Depositing and recovering.....W. A. Hendryx
Meter.....D. Broido et al
Mining column.....J. W. Kittrege
Mold.....W. B. Norton
Mosquito netting frame.....M. E. Kelly
Motor control system.....A. Sundh
Mower, Lawn.....I. Ellwood
Music indicator.....E. Wilson
Music roll spool.....G. H. Davis
Nail clipper.....G. Havell
Nest trap.....W. E. Olmsted
Nut, Adjustable axle.....C. Miller
Nut adjuster, Rail bolt.....H. Smiley
Nut lock.....J. W. Higginbotham
Nut lock.....W. W. Morey
Nut lock.....B. A. Van Wormer et al

Nut lock..... T. P. Vucannon
Nut lock..... F. W. Newman
Nut lock..... A. R. & W. F. Keehl
Nut tap..... W. M. McKenzie
Oil cup..... J. H. Davis
Oils. Producing purified hydrocarbon.....
Oiler. Multiple..... L. B. De Camp
Organ..... M. Montfort
Oven doors. Securing means for windows of..... C. S. Haskell
Oxide. Reducing refractory..... G. F. Pross
Packing device. Rotary..... K. A. Kuhne
Packing for pumps for oil wells, &c..... F. L. Gregory
Packing. Manufacturing of..... F. M. Kleckner
Paintings. Producing facsimiles of oil..... L. E. Adams
Paper..... H. F. Gribble
Paper clip..... T. Scherf
Paper holder and filler..... J. R. Day
Paper softening apparatus..... W. W. Wilhelm
Pavement plant. Plastic..... T. Scherf
Peanut Roaster..... G. W. Lamson
Pen..... W. C. Huyck
Pen and locking device therefor. Self filling fountain..... C. W. Butterworth
Pen. Fountain..... T. Stevens
Pen. Fountain ruling..... W. K. Holmes
Pencil. Lead..... C. H. Smith
Phonograph horn support..... O. L. Eudres et al
Phonographs. Horn supporting appliance for..... E. C. Goldsmith
Phonographic horn..... L. Devineau
Planos. Pneumatic for autopenumatic..... J. Carruthers
Picture apparatus. Safety appliance for moving..... A. F. Elkins et al
Picture hanging device..... L. Rynek
Picture size changing device..... W. S. Franklin
Pie rack. Revolving..... T. W. Hawthorne et al
Pie trimmer..... J. S. Croxford
Pipe clamp..... G. S. Benedict
Pipe cutter..... W. W. Vosper
Pipe. Device for preventing the flattening of the ends of..... G. G. & R. O. Blakey
Pipe machine..... A. McKenzie
Piston rod connection..... A. F. Rockwell
Planter. Corn..... L. D. Benner
Plow carriage..... J. Q. Blue et al
Plow carriage. Motor..... J. Q. Blue et al
Plow. Reversible disk..... R. C. Belk
Plows. Tail block for sulky..... F. L. Thompson
Plug. Attachment..... W. C. Tregoning
Pneumatic despatch carrier..... J. W. Upp et al
Pocket book safety attachment..... S. W. Wilson
Pole arm. Wrought metal..... M. E. Harrison
Pole socket. Rear end..... J. Braun
Power drill..... S. W. Boone
Power machine..... P. F. Oddie
Power transmission gearing..... H. O. Fletcher
Power transmission mechanism..... J. K. Cochran
Power transmission mechanisms. Automatic holding device for..... M. J. L. Towler
Power transmitting means..... J. M. Joy
Power transmitting mechanism..... G. Olton
Pump..... T. H. C. Homersham
Pump coupling. Automatic..... C. B. Haldeman
Pump operating mechanism. Chain..... D. K. Keller
Pump. Rotary..... C. H. Jaeger
Purse..... E. J. Wilkins
Puzzle..... J. B. Schmalz
Quartz mill..... C. E. Humphreys
Rail brace..... J. F. Witt et al
Rail clamp..... J. C. Cantleberry et al
Rail joint..... G. V. Lawrence
Rail support..... G. M. Cote
Railway crossing..... W. V. Cushing
Railway rail..... J. G. Reed
Railway rail..... L. D. Meckley
Railway signal..... W. J. Gustin
Railway signaling apparatus..... H. W. Spang
Railway. Surface contact electric..... W. M. Brown
Railway switch..... A. H. Winter
Railway switching mechanism. Electric..... E. W. Clark
Railway system. Flangeless..... L. Beecher
Railway tie..... J. Carr
Railway tie..... S. M. Coleman
Rat and mouse trap. Self setting..... F. H. Newlove
Razor..... O. A. R. M. Schmidt
Razor. Safety..... A. F. Bradshaw
Razor. Safety..... F. H. Hoffmann
Razor stropping device..... W. Sharples
Rein holder..... W. A. Hutson
Retorts. Refractory lining for..... F. B. Smith et al
Ribbon shifting and retaining mechanism..... A. Fuhlendorf et al
Ring and listening key..... H. L. Knight
Rivets. Forming..... W. P. Bartel
Roll grinding machine..... F. L. Brown et al
Rolling mill..... T. S. Blair, Jr
Rotary engine..... L. E. Cummings
Rule. Letter and numeral..... A. M. Wing
Saddle. Harness..... M. Lauterbach
Safety device..... G. G. Wacker
Safety pin..... R. B. Ferguson
Sand bars in watercourses, &c. Means for removing..... N. Jomini
Sand trap..... C. E. Warner
Sanitary system..... W. Walker
Sanitary T..... J. L. Frunk
Sash fastener..... P. H. Graham
Sash fastener..... J. W. Wynn
Sash lock..... W. H. H. Marcum
Saw setting apparatus..... J. J. Dnaue et al
Sawing machine. Shingle..... G. G. Gritman
Sawmill gage..... A. M. Dow
Scale for dividing circles into equal parts..... O. Gazel
Scale. Wagon..... J. F. Hinck et al
Scoop frame. Hop..... J. N. Hoffman
Scraper. Wheeled..... A. S. Rowsey
Screw driver..... J. A. Zeman
Sewage and the like. Apparatus for separating and purifying..... E. Merten
Sewer mold..... G. Georgenson
Sewing machine feeding mechanism..... H. H. Cummings
Shank stiffener..... G. F. Dunn
Shipping receptacle..... A. J. Wurts
Shoe uppers and soles. Assembling..... W. H. Hooper
Shoulder strap..... F. A. Felts
Sifter. Ash..... S. J. Tobiasz
Signal..... W. H. Nelson

Silicospiegel. Producing..... E. F. Price
Skittles. Stand or supporting base for..... M. Pieper
Slimes treatment..... C. E. D. Usher
Smoking pipe..... G. W. Clapp
Sod cutter..... E. W. Hoppe
Soda fountain syrup pump..... F. H. Hecker
Soldier nipple holder and wiping bracket..... J. C. Polson
Soldering iron..... G. D. King
Solder. Automatic groove cutting machine for wooden shoe..... H. Busse et al
Sound reproducing machine..... F. Myers
Spark arrester..... O. G. Sunden
Speed governors. Oil brake for..... M. Haeblerlein
Speed indicator. Recording..... C. F. Isard
Speed indicator recording device..... C. F. Isard
Speed mechanism. Variable..... W. Bowne, Jr. et al
Spinning spindle..... 3 pats..... D. Lemoine
Staker. Hay..... F. C. Jacobs
Stair..... A. G. Gustafson
Stalk cutter..... R. B. Human
Steam generator. Water tube..... F. J. Manney et al
Steam trap..... R. M. Dixon
Steering gear..... P. A. Custer
Stenciling machine..... W. G. Frierly
Stenter clip..... J. R. Riley
Stereotype plate casting apparatus..... R. C. Annand
Stereotyping and the like. Production of matrices for..... S. A. C. Kristensen
Stethoscope..... F. Dittmar
Stick feeder..... I. E. Redell
Stone. Artificial..... G. Hammond
Stove and grate therefor..... W. G. S. Symmons
Stud..... J. Lizotte
Superheater..... S. Munson
Surgical ligature..... A. W. Clark
Surgical needle..... W. R. Burch
Suspended hook. Portable..... O. McGrady
Suspensory..... H. A. Frye
Switch point guard..... W. A. Hutson
Table article..... E. E. Motter
Table lock. Pedestal..... E. Tyden
Telegraphic and telephonic impulses. Simultaneous transmission of..... I. Kitsee
Telephone cable terminal..... E. C. Flory
Telephone exchange system..... E. E. Clement
Telephone exchanges. Coin-collecting apparatus for..... C. D. Enoch
Telephone lock out device..... D. W. Kneisly
Telephone system. Multiple station..... A. J. Farmer
Thills. Temporary repair device for wagon..... E. W. Crispell
Thimble and flue stop. Combined..... E. E. Hanken
Threshing cow peas. Apparatus for..... J. J. Koger
Tile with light pane. Cement..... I. H. Freund
Tire for vehicle wheels. Resilient..... O. B. Beach
Tiresupporting and retaining means..... W. A. Allen
Toaster..... A. W. Kodatz
Tobacco shade..... R. S. Mathews et al
Tool. Combination..... H. G. Ahlberg
Toy..... E. J. Roberts
Toy puzzle..... D. H. Martin
Track moving apparatus..... L. L. McCullough
Train order deliverer..... S. T. Harvel
Tramway. Aerial..... O. J. Davy et al
Transformer..... C. E. Allen
Transformer core..... W. A. Hall
Transformers. Dial switch for regulating..... H. I. Washburn
Transformers. Protective device for..... E. A. Wagner
Transmission mechanism..... G. H. Wood
Transmission of induced impulses..... I. Kitsee
Trap adjuster..... F. H. Crago
Traveling bag..... A. Kahlow
Traveling bag handle fastening..... A. Kahlow
Trestle..... J. C. Scoggins
Trolley pole. Automatic..... E. W. Fellows et al
Truck..... J. F. De Voy
Truck bolster. Car..... J. M. Ames
Truck. Brick and tile..... J. F. Siegel
Truck frame. Car..... R. C. Wright et al
Truck. Pneumatic..... A. R. Bannerman et al
Trucks. Cast steel side frame for car..... A. Lipschutz
Trucks. Construction of car..... R. C. Wright et al
Trunk..... A. Kahlow
Trunk..... J. A. Hackett
Turbine..... W. A. Waddell
Turbine. Elastic fluid..... A. R. Dodge
Turbine. Elastic fluid..... W. L. R. Emmet
Turbine governing mechanism..... F. Samuelson
Turbine governing mechanism..... J. G. Callan
Turbine governing mechanism..... W. L. R. Emmet
Turbine. Water..... A. Nelson
Turning tool..... J. Hartness
Twine machine. Grass..... T. W. Jerrems
Typewriter..... G. D. Lord
Typewriters. Bearing for type bars of..... L. R. Roberts
Typewriting machine..... T. L. Dennis
Typewriting machine. 2 pats..... A. W. Smith
Vacuum machine..... P. H. McCabe et al
Valve..... H. C. Montgomery
Valve..... T. F. MacMullen
Valve. Automatic controlling..... R. M. Haley
Valve. Automatic gas regulating..... B. M. Lewis
Valve gear for internal combustion engines..... F. W. Brady
Valve. Reversing..... J. B. Ladd
Valve. Safety..... F. Gaudin
Valve. Safety..... C. E. Norton
Valveseat..... I. M. Hartman
Valve. Throttle..... N. W. Fletcher
Vapor burner..... A. H. Waite
Vehicle body..... A. A. Gaylord
Vehicle brake..... M. Fischer
Vehicle coupling..... G. M. Olsen
Vehicle reach..... M. Bisbing
Vehicle steering gear. Motor..... G. A. Gemmer
Vehicle wheel..... O. Skog
Vehicles. Apparatus for controlling the motor and driving mechanism of self-propelled..... L. T. Gibbs
Vehicles. Compensating gearing for motor..... H. White
Vehicles. Sleigh attachment for..... R. Knebeke

Veil shield..... C. A. George
Vending machine..... W. H. Parker
Vending machine..... A. Jaeger
Vessel..... R. B. Little
Vessel hull..... C. A. Manker
Vessel unloading apparatus..... A. Schwartz
Vessels. Bow protector for..... G. Hollinshead
Visual signal and key..... K. M. Turner
Voting machine..... W. Langrill
Wagon. Dumping..... A. Flowers
Wall construction..... O. F. Mann
Wash boiler attachment..... A. S. Burklett
Washing machine..... F. A. Dinsmore
Washing machine..... J. W. Dunsire
Water cooler stand..... H. G. Cordley
Water elevator..... J. E. Neil
Water level indicator..... E. A. Schreiber
Water lifting apparatus..... G. W. Palmer et al
Water purifying apparatus..... A. Sorge, Jr
Water purifying apparatus..... A. O. Tate
Welt marking machine..... W. H. Hooper
Wheels to shafts or axles. Means for securing..... T. S. Scott
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Window screen..... I. Stork
Wire rope..... A. B. Allan
Wire stretcher..... C. Gregory
Wire stretcher..... U. G. Sperry
Wire twisting device..... J. D. Bourne
Wood product..... W. D. Craig
Woodworking machine..... J. W. Johnson
Woven fabric..... W. L. Turner
Woven fabric to imitate leaded stained glass windows..... W. L. Turner
Wrench..... V. Hansen
Writing. Holder for manifold..... F. M. Turck

DESIGNS.

Advertising flag..... S. Robin
Bottle..... C. E. Naudand
Dish or cup holder..... J. E. Straker, Jr
Fabric. Textile..... 5 pats..... H. P. Johnstone
Lamp Gas..... J. Maas
Spoons or similar articles. Handle of..... J. Mayer
Transformer case..... W. A. Hall

Issued July 30, 1907.

MECHANICAL PATENTS.

Abdominal support..... reissue..... M. L. Digney
Acetylene generator..... J. C. King
Adjustable bracket or fitting for supporting shelves, &c..... W. Rhodes et al
Advertising device..... 4 pats..... J. T. H. Mitchell
Advertising device..... D. E. Bohannon
Advertising purposes. Mechanical apparatus used for..... F. A. Venziani
Air brake apparatus..... reissue..... C. E. Turner
Amusement apparatus..... C. L. Barnhart
Amusement device..... F. W. Thompson
Amusement device..... G. E. Williams
Animal lifter..... P. M. Leffridge
Automatic alarm..... C. W. Smith
Automobile driving gear..... H. Tenham
Automobile speed regulating device..... H. Mayer
Automobile track and means for holding an automobile thereon..... L. S. Hackney
Axle box..... C. A. Latham
Axle cutting device..... W. F. Sullivan
Axle for wheels. Non wearing..... B. T. Chaytor
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Bearing. Roller..... C. O. Johnson
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Bed attachment. Folding..... J. A. Linn
Bed bottom. Spring..... H. M. Fillvaw et al
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Bottle capping machine..... H. S. Brevington
Bottle. Non refillable..... W. T. Harper
Bottle. Non refillable..... F. Groat et al
Bottle washing apparatus..... W. S. McKinney

(Continued in October Number.)

Drawings for Inventors.

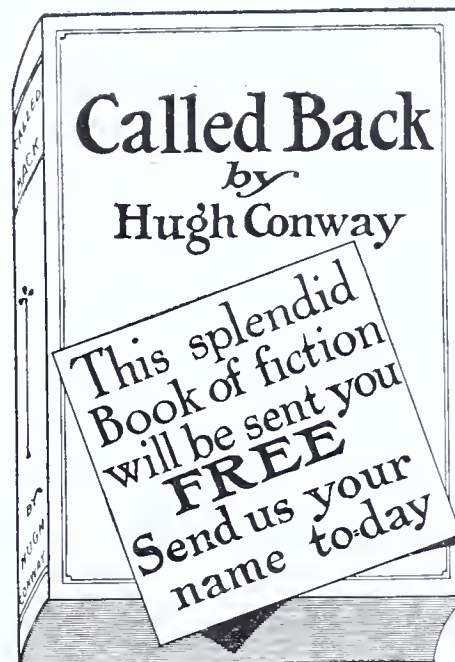
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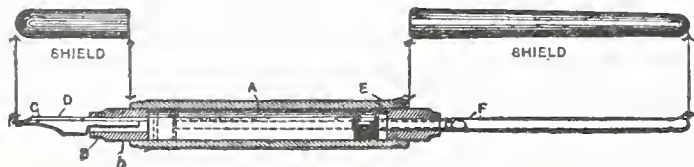
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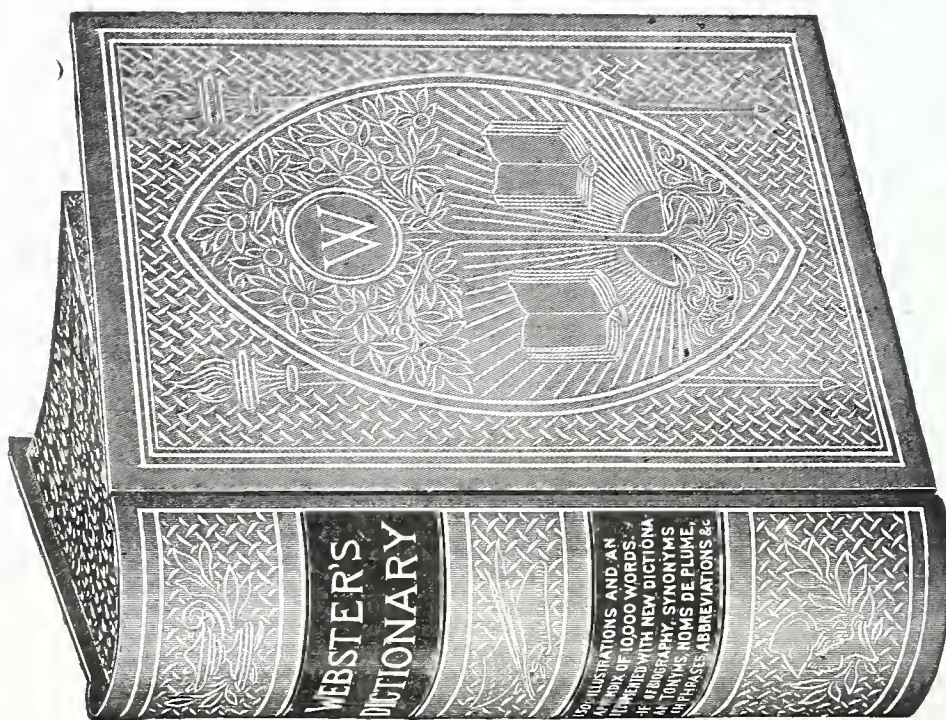
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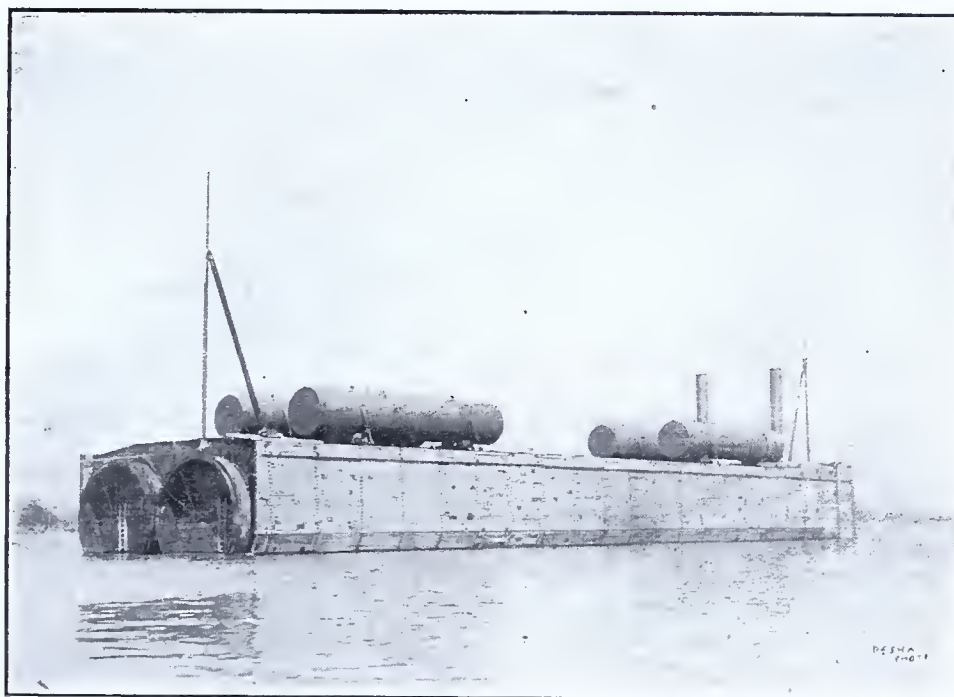
NINETEENTH YEAR.
No. 10.

WASHINGTON, D. C.—OCTOBER, 1907.

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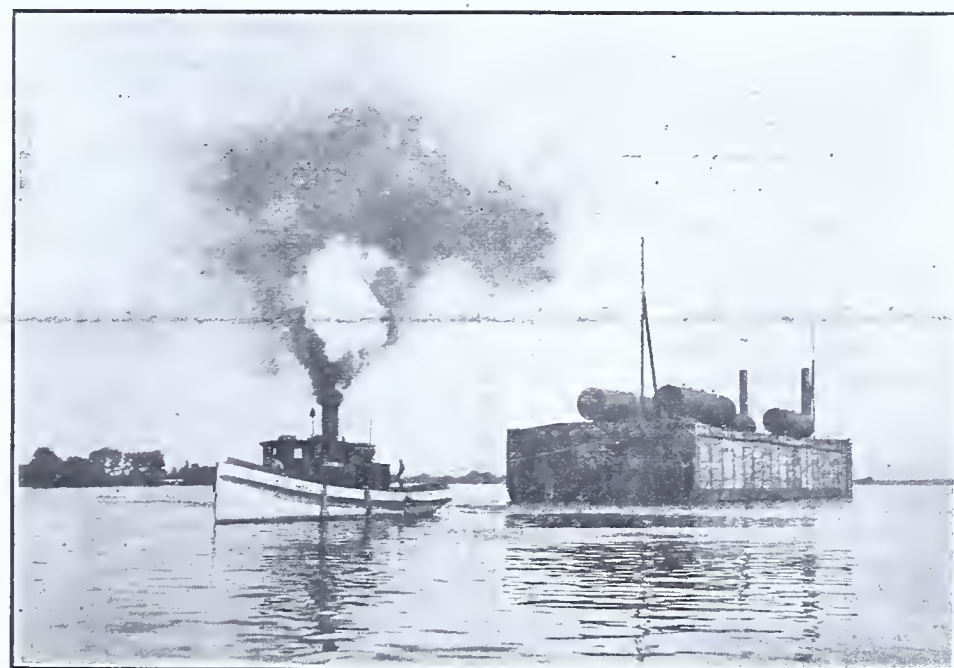
THE TRIUMPH OF TUNNELING.

THE last decade of the nineteenth century was conspicuous for the advance in the construction of tunnels. The demands of the railroads for shortening the distance of travel and economizing time, stimulated engineering effort, and millions of dollars were expended in piercing the earth with great underground passageways. Mountains that were once thought impassable, no longer present an obstacle in the pathway of modern travel. Indeed, the tunneling of huge mountains is not now considered a remarkable feat. When the Mount Cenis tunnel was opened, back in the seventies, it was hailed as one of the wonders of the world. It took thirteen years to build, and that was considered a marvelously brief period, as the time estimated had been thirty years. The Simplon tunnel, which was opened year before last, attracted much less attention, although it was five miles longer than the other, and involved many novel problems in engineering—such as the boring of extra tunnels to serve as ventilators; the finding of great streams of water, and of hot springs, that raised the temperature to such a height that the men could work only half an hour at a time, and iced spray had to be introduced for cooling the air; and the encountering of an enormous bed of moving sand. But engineering genius was quite equal to all emergencies, and the world was not even surprised. It is in subaqueous work that the really serious difficulties of modern tunneling reside. The nature of the soil is largely unknown, and the work may have to encounter faults in rocks, or springs or quicksands in the earth; or the roof formed by the river bed may give way; and tons of water may be precipitated into the workings below. Under these conditions, work beneath the water has become a new science which has its own special class of workmen, tools and devices adapted particularly for its own obstacles, and even its own diseases—for “the bends” is thought to appear in a worse form in tunnels than in other caisson work. In spite of all drawbacks, never has there been such activity in digging



tunnels as in these early years of the twentieth century. Around New York City alone, sixteen miles of subaqueous work is under way. When all the

Jersey to Long Island under two great rivers and an island. There will be three stories of these underground passages beneath the heart of



bore is completed, Manhattan may be described as a body of land honeycombed by tunnels. In one system, passenger trains will run from New

the city. The whole represents an engineering achievement truly imperial in conception and execution.

Similar enterprises, quite as im-

portant, are going forward in other parts of the country. One of the most interesting of these is an international affair—the tunnel that is being dug under the Detroit River, to join the United States with Canada. The Detroit river, like the Hudson, was long considered impracticable. After several attempts had been made, and millions of dollars poured into the cuts, engineers asserted that it would be impossible to tunnel under the Hudson. The Detroit presented equal difficulties. Both have now been conquered, and the accompanying illustration shows a section of the great Detroit river tunnel, (constructed for the Michigan Central Railroad) as it is being floated down the St. Clair river from the shipyard at St. Clair. There will be ten sections like the one depicted, and each section is 260 feet long, the tube being 23 feet, 4 inches in diameter. These sections are laid in a trench dredged in the bottom of the river, and encased in cement. The total length of the excavation, including approaches, will be nearly two and a half miles, of which two thousand six hundred and twenty-five feet will be directly under the water. The total cost of the work is estimated at ten million dollars, and it is expected to be completed by June, 1909. It will be double track, and its annual capacity is calculated at 1,000,000 cars, increasing the present traffic facilities over 300 per cent. The diameter of the tubes is the same as that of the Pennsylvania tunnels at New York.

It is a unique experience to go down into one of these tunnels, and may be recommended to anyone with a thirst for adventure or for a new kind of “thrill.” A man enters an elevator and drops from the surface to a “lock” at the bottom of the shaft—so far, the descent is like that into a mine. The lock is studded with bolts like a boiler, and when the door is closed a valve is turned, and compressed air from the tunnel begins to rush in with a hissing as of escaping steam. Pound after pound to the square inch the pressure slowly rises. The occupants of the lock feel it in the

drums of their ears, which begin to press in as though they would burst. It is necessary to close the nose and puff air sharply down the nostrils until the air enters the Eustachian tubes and pushes out the drums, thus equalizing the pressure on both sides of them. The voice sounds unnatural, as it would if all the teeth were out. Men have to shout to make themselves heard. The atmosphere grows insufferably hot and stuffy, for air rushing in and being compressed, gives out heat. At last the pressure reaches the right point, and the door into the tunnel is opened. Here the "sand-hogs"—as laborers in compressed air are called—toil in shifts of three hours, pushing little cars full of sand and rock that has been taken out from before the shield. Every few feet an incandescent light gleams in the misty darkness.

The shield is the vital point in tunnel construction. It is a sort of cylinder or sleeve, which, as the excavation proceeds in front of it, is forced ahead to act both as a ring-shaped cutter and a protection to the workmen, its advance being effected by powerful hydraulic jacks or screws which find a back bearing against the completed wall. As the digging proceeds the shield advances, and a section of tunnel is built behind it which, in turn, furnishes a bearing for the jacks in the further advance of the shield. The drills are operated by compressed air, and the pressure is so strong (about 30 pounds to the inch) that when the material is not quicksand, it is possible for the men to work in advance of the shield, as the air itself holds up the roof of such an excavation. It is a weird sensation to realize that only air stands between one and destruction. At some points the men can feel the air escaping, especially if the river bed dips down too close to the tunnel. The escaping air then appears at the surface of the water in bubbles, and at this danger signal, scows dump hundreds of tons of clay into the river overhead, and through this artificial river bed, work goes ahead. If the roof becomes too thin, however, a "blow out" occurs, and then the current of air is such that the men are flattened out against the roof of the tunnel and held like flies on a ceiling. Accidents, however, are not of frequent occurrence.

As already noted, tunnel work is a highly specialized form of labor. Most of the men have had years of experience, and many have been in big tunnel jobs the world over. Applicants are examined by a physician as to the condition of heart, lungs and throat. If a man be sound in these particulars he can, with practical safety, work in compressed air. Large numbers of the "sand-hogs" are negroes, for they stand the air better than men of almost any other color.

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ASBESTOS SHINGLES.

By CHAS. H. STRINGER.

Ever since the beginning of time, the question of roofing, from the most primitive form, as seen in the straw-thatched hut, has been looked into by every one contemplating a roof for any sort of a building. Of later years slate came into use, and still later, ready roofings and the cheaper slag and felt forms. Some of these materials are good, and many indifferent. When one considers the small cost of a roof in comparison to the large cost of erecting the building, and the interior furnishings, fixings, etc., it behooves anyone who is anxious to protect and save the money he has already spent in the walls, fixings, etc., to put on a roof that is permanent. After all is said and done, the best roofing is by far the cheapest in the end. For this reason a roof that is rough sheathed and covered with asbestos shingles makes the best and cheapest roof. Asbestos shingles may be applied directly to the lath or strips, and spaced the proper distance to take care of the size of shingles decided upon. The various roofs that have been in use for some time have demonstrated that, like the most of other materials, there is painting or maintenance to be taken into consideration in caring for the roof, and it remained for the inventor mentioned below to produce the greatest invention in roofing materials of the age. In asbestos shingles one has a roof, when properly applied, that will outlast the lifetime of the building. The simple exposure to the elements causes the cement that has been deposited upon the asbestos fibre in the process of manufacture to crystallize, and it then becomes better and better—in fact, more serviceable as time rolls on. Cement has been known to crystallize as long as twenty-eight years from the time it was first mixed. This is only proof of the claims made for asbestos shingles that they improve, toughen and harden with exposure to the elements and atmospheric conditions. In addition to this, another good point which these shingles have is one that is not to be overlooked by any manner of means: that is the fact that they do not have to be painted to preserve them, as the elements take better care of asbestos shingles than the best paint or dressing that has ever been manufactured.

The great invention covered by L. Hatschek's Reissued Patent No. 12, 594, under date of January 15, 1907, for a fireproof building material composed entirely of asbestos fibre and hydraulic or Portland cement, marks an epoch in the building industry, and a new birth in the matter of fire protection, so far as fireproof construction is concerned.

Being fireproof and not affected by continuous moisture, frost or subject to deterioration by the elements in any way, it is obvious that asbestos shingles and asbestos building lumber may be employed freely and confidently in a vast variety of places where ordinary lumber has failed.

Primarily designed to replace the

ordinary roof coverings only, its merits have been found to be such that its employment by our best architects and engineers has extended to all classes of work wherein its many desirable qualities have supplanted other materials heretofore commonly in use.

It is perhaps superfluous to an educated person to say that asbestos shingles, slates or sheathing made wholly of mineral fibre, asbestos and hydraulic cement, are both fireproof and indestructible. Both asbestos, or mineral fibre, as it is often called, from its peculiarity of crystallizing in fibres instead of in ordinary crystals, as is the usual case with mineral materials, and hydraulic cement have been known from the earliest times, as among the most refractory of substances. The old Greek and Roman remnants of antiquity, composed largely of hydraulic cement, remain mute witnesses of the everlasting quality of this material. Asbestos fibre has remained exposed to the elements for unnumbered centuries, without deterioration, while its well-known fireproof quality renders it the most suitable fibre upon which to crystallize the cement deposited thereon in the course of manufacture. It is therefore evident, from the well-known qualities of these two materials, that nothing could have been selected that would have been more fireproof, indestructible and everlasting than asbestos fibre and hydraulic cement as raw materials from which to prepare a permanent building material such as we have derived through asbestos shingles and asbestos building lumber. Nails may be driven through asbestos shingles and asbestos building lumber by a quick, sharp blow of the hammer, quite close to the edge without danger of fracture, thus differing materially from all other sheathing materials in this important attribute of toughness and homogeneity.

It is sufficiently elastic to allow of marked tension due to vibration, expansion and contraction of surrounding parts, wind pressure, etc., without cracking or breaking in any manner. The resistance of these shingles to blow, flexion, tensions, etc., is enormous and surprising. These shingles may be punched, filed or worked generally with the greatest ease, with ordinary tools such as are used for working natural slate or wooden shingles. They become very hard, particularly if exposed to the weather, or after the lapse of years. One great and desirable feature of them is that they can be successfully joined, fitted, etc., by the work of ordinary mechanics, no unusual or special knowledge being required in handling them.

Owing to the enormous pressure under which the shingles are manufactured, they absorb, when fresh, only about four or five per cent of their weight of water, thus forming, as will be seen, a roofing tile of most excellent quality. Exposed to the action of the atmosphere for a year or two, the hydration and subsequent crystallization which takes place, converts them into absolutely impermeable roof coverings, which, as such, defy all changes of climate and thus

become greatly superior to other forms of sheathing.

On account of the lightness of weight of the asbestos shingles (the French method of application only weighing 250 pounds, and American only 375 pounds per finished square), the framing may be of much lighter construction than that designated to carry slate roofs, hence a very considerable sum is saved in building construction, while the shingles may be cut or sawed, shaped to fit around dormer windows, chimneys, etc., without fear of injury to those surrounding them. When with these good features is combined the absolute unalterability of the shingles, their economy of application and maintenance, their fireproof qualities, their toughness and elasticity, it is not to be wondered at that they make the best roof covering ever produced, either of natural or manufactured materials.

The French method of applying asbestos shingles or roofing slates has many advantages over any other usage. Among the advantages which this secures are the reduced cost of both the amount of material and its application, reduced weight of the completed roof and the variety and beauty of design, which may be thus secured. After very careful observation in this and the several European countries, we have become so thoroughly convinced of the value of this method of application that we, without any hesitancy, recommend it to all who desire a handsome and serviceable roof covering at a moderate cost. This French or diagonal method of application can be used upon nearly every class of structure where there is sufficient pitch of roof for the ordinary use of wooden shingles or natural slates. No matter under what atmospheric conditions they may be applied, heat or cold, wet or dry, the asbestos shingles stand today unapproached in the line of roof coverings by any other material. By this method of application the nails used in one shingle are entirely independent of any other shingle, thus allowing for expansion or contraction without placing an unusual strain on either the fastenings or the shingles. —*Southern Building Record.*

The Smoke Evil.

Possibly experimenters have been working at the wrong end of the smoke problem in seeking an apparatus which will consume the smoke while it consumes the coal. The gas-man separates the coal, taking what he wants in his business and selling the coke remainder to be burned. In the same manner a Londoner, one Thomas Parker, who is said to be an eminent engineer, has invented a process by which all the smoke-producing qualities are removed from coal before it is fired. The process, which has not been made public, is by a distillation of the coal at low temperature. The process saves the hydrocarbons intact and gives a glossy substance which is claimed to have more heat value than the original, while it is free from dirt. The process has been indorsed by Sir W. B. Richmond, Royal Academy, president of the Coal Smoke Abatement Society, who declares that its general adoption in the metropolitan district is desirable. He believes if its use became general the greatest evil of modern times, coal smoke in the air, would be overcome, and that if this were done London would rise in new splendor. Not merely London, but the cities of all the world would take on new life if coal smoke in the air were abated. The Parker process apparently makes hard coal out of soft coal by removing the loose volatile parts which fly up the chimney in soot and become an offense to the nostril, a danger to health, and a curse to mankind generally.

ELECTRICAL RETORT CHARGING MACHINE.

MECHANICAL machines for charging and discharging gas retorts are extensively used, but one difficulty has existed, namely, that two machines are required to do the work, one for charging the retort, the other for discharging it. A new French machine, however, combines these two functions.

The accompanying illustration shows one of these machines as installed at the gas works in Lille, where they are used to feed a battery of five furnaces, each furnace having eleven retorts of 11 feet 4 inches in length.

The originality of this type of retort-charging machines lies in the fact that the ladle consists of two separate parts, movable with respect to one another. On entering the retort it discharges the coke and leaves a fresh charge of coal as it is withdrawn, the coke being pushed out of the rear end of the retort. This form of apparatus thus necessitates the use of retorts open at both ends, the coal for distillation being in this manner completely separated from the coke. Although in some cases this would be a serious drawback, in others advantages are found for this kind of construction.

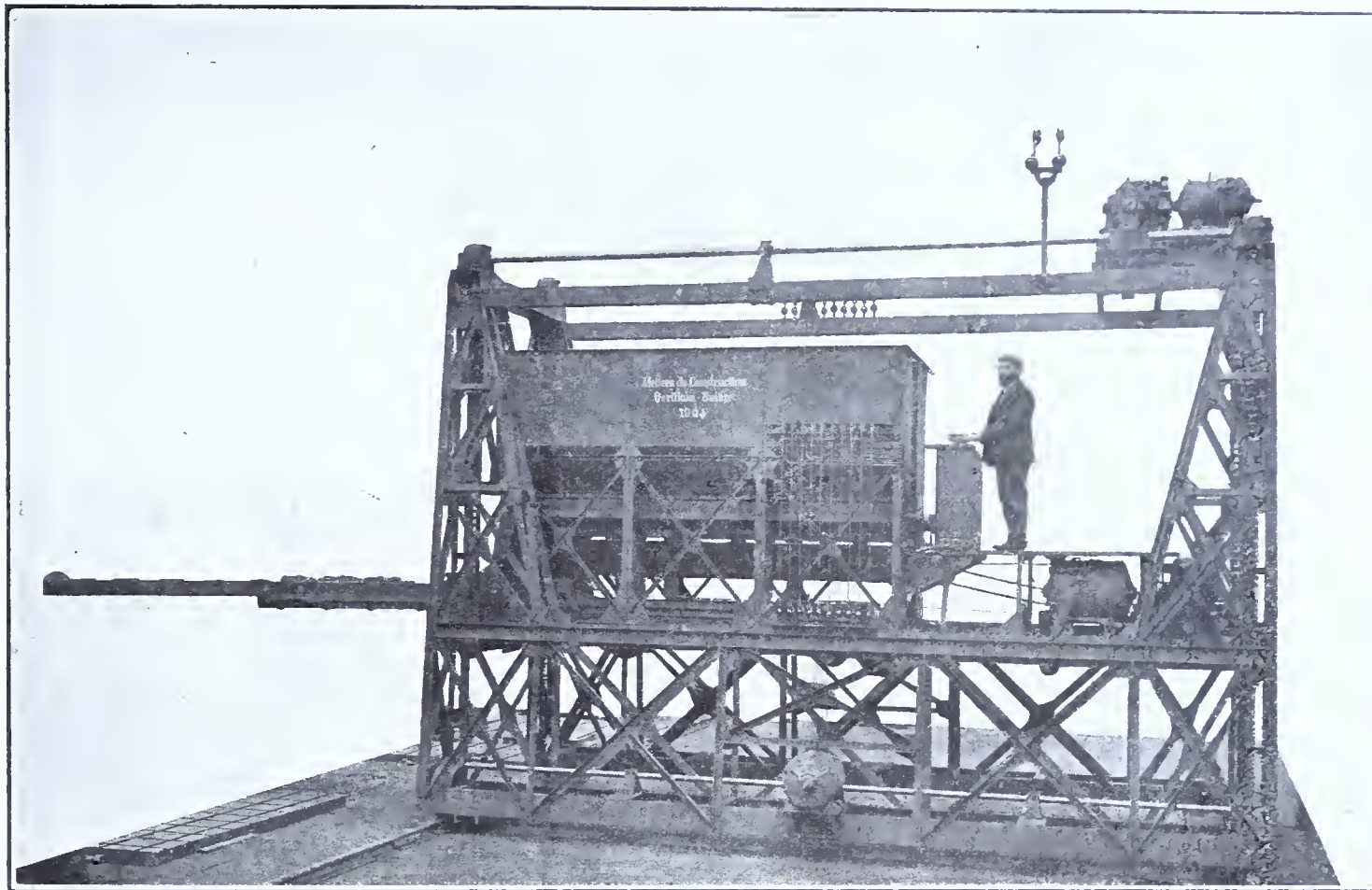
The movement of the engine is effected very simply by an electric motor, which controls the ladle, and is driven by worm gear and pinions, a cable fastened to the bottom of the ladle, or else a drum which winds up a chain connected with the frame. After the ladle has entered the retort far enough, this frame locks, the bottom part of the ladle is withdrawn,

and the charge of the coal is allowed to drop.

The ladle weighs about 400 pounds and is provided on the end with a hinged shield, so that it can be drawn out without interfering with the charge. The bottom, as it reaches the end of its travel, unlocks the frame, which in turn is drawn back ready for the next retort, all the move-

ments taking place automatically. After the apparatus has once been started, nothing more is necessary, as the ladle and frame continue in oper-

The vertical movement is effected by means of chains, which are driven through sprocket wheels by a motor. This motor, on lowering the gear,



A NEW HIGH SPEED ENGLISH MOTOR LAUNCH.

By FRANK C. PERKINS.

The fast English motor boat "Svip" is shown in the accompanying illustration under full speed making over 20 miles per hour. It is constructed of cedar, carvel built and varnished



inside and out. The Svip is 35 feet long and has a beam of 5 feet 9 inches with a draft of 1 ft. 6 inches. It was engined and designed by John Thornycroft & Co. Ltd., of Church Wharf, Chiswick, and was built for fast cruising, with comfortable seat-

ing accommodations for 15 or 16 persons, while it is stated that it will stand a very fair sea with safety and comfort.

One of the interesting features of this English motor boat is the sliding hood, which, when desired, can be rolled up at the forward end, being instantly collapsed without difficulty.

The engines drive twin screws, two Thornycroft gasoline motors being employed, each having four cylinders and developing 24 horse power. The ignition is of the standard low tension magneto type and the exhaust is arranged with a neat funnel muffler fast-

ened until the work is completed, when they automatically stop.

For the complete operation of charging, only one minute is required. The coal hoppers with a capacity of 6700 pounds each, are placed on the framework, and fill the ladle through valves in the bottom. Four cables suspend the entire platform, with bunkers and charging mechanism.

acts as a generator. An electric brake is connected with the electrical circuits in such a manner that an accurate adjustment of the charging apparatus can be obtained. The various movements of the levels are controlled from the same box. The new machine is called the Bertrand-Oerlikon, and its working is said to be very satisfactory.

ened to a baffle plate over the motors.

It is maintained that the first time the engines were started a most satisfactory run was made, the boat making a speed of 20 1/4 miles per hour. A penalty was attached to the guarantee of this English concern that the boat was to attain a speed of 20.5 miles per hour with 2 passengers.

When the "Svip" was tested at the official trials, it was found to be capable of a speed of 21.2 miles per hour with 3 persons on board, this being the average speed attained in running 6 times over a measured mile both with and against the tide. It is held that with an extra passenger, it therefore made nearly 1 mile per hour over the contract speed.

Some unique and interesting types of high speed boats have been constructed in this English yard at Chiswick, including a number of Torpedo boat destroyers, of a new class, for the British Navy.

Potato Pencils.

The material generally used for pencils, everyone knows, is red cedar; but the quantity consumed for this little article is not so universally realized. The pencil is one of the most common articles in every day use, and 315,000,000 are manufactured every year in our country alone.

This demands 109,000 tons of wood, so that each day in the year 300 tons, or 20,000 cubic feet of wood are consumed for pencils. As already noted, by far the greater part of this wood is red cedar. Its softness, straight grain, and freedom from defects adapt it especially for this purpose, and up to the present, a suitable substitute has never been found. Indeed, it is doubtful if any other industry that uses wood is so dependent upon a single species as the pencil industry is dependent upon red cedar.

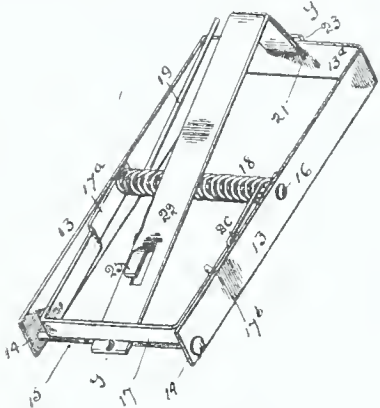
But in common with all our other woods, the supply of cedar is diminishing. An enormous quantity is sawn up daily, and as no steps have been taken to provide for a future supply, it is only a question of time when it will be practically exhausted. In view of this coming scarcity, it is of interest to hear that a new composition has been invented, which is said to take the place of cedar for pencils. It is a form of potato starch. One of our consuls in Germany, where it is being manufactured, describes it as a compact mass, and the pencils made from it as having the same size, form and appearance as those now in use. They are a trifle heavier and sharpen more easily; but they serve their purpose well, and can be produced at a nominal figure. The pencils, he thinks, can be placed on the market at a price varying from one half a cent to one cent apiece. A large acreage of the Fatherland is devoted to the cultivation of potatoes, and many novel uses have been found for them. This invention may mark the beginning of a new era in the production of lead pencils.

CLEVER NEW PATENTS.

Animal Trap.—Curtain Shade Adjuster.
Bolt Anchor.—Hand Attachment
for Sewing Machines.—Coffee
or Teapot Strainer.

Animal Trap.

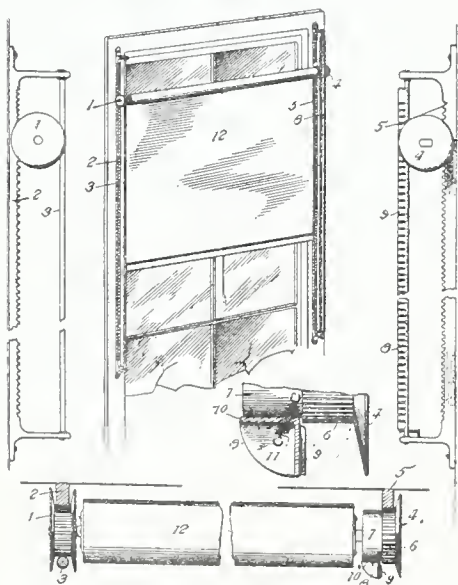
An exceedingly simple animal trap has been recently patented by Albert M. Grubbs, a well known inventor of Forest Grove, Oregon, who has assigned a one-half interest in his patent to J. N. Hoffman, of the same place. In constructing the trap, a U-shaped metal frame 13 is employed, the front end of the side bars thereof being connected by a cross rod 15. A swinging jaw 17 is pivoted on a cross rod or rivet 16 that connects the side bars of the frame, and swings between the side bars, being urged to the position shown in the illustration, by a coiled spring 18. A trigger 22 is



pivoted on the cross piece 13a of the frame, and has a shoulder on its pivoted end behind which the jaw 17 is engaged when the trap is set. Bait is secured to the trigger by the hook 25. In setting the trap, the jaw 17 is turned back until its cross bar slips beneath the shoulder and is caught thereby, the trip 22 being slightly elevated so as to hold it. Therefore, the slightest depression of the free extremity of the trip caused by an animal attempting to remove the bait, will free the jaw 17, and under the action of the spring 18, will swing to a position to catch and hold the animal.

Curtain Shade Adjuster.

An exceedingly novel mechanism for effecting the adjustment of a curtain roller so as to permit ventilation and the passage of light thereover, has been patented by Mr. Fred S. Hazelton, a well known inventor, of Norton, Kans. Two racks 2 are employed that are secured to the opposite sides of the window frame,



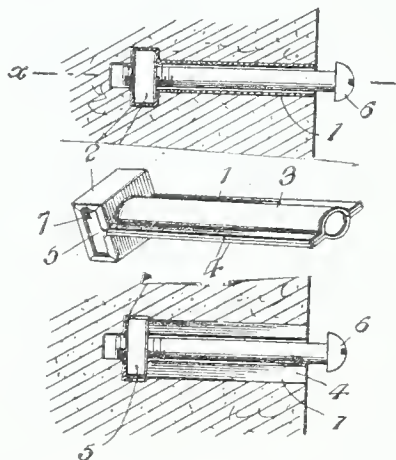
and the curtain roller is provided at its ends with gear wheels that operate against these racks, one of the gear wheels being held against the rack by

a vertical rod 3, the other being maintained against its rack by a swinging bar 8. The latter gear wheel 4 has a toothed portion 6, and a smooth portion 7, and the bar 8 has angularly disposed faces, one of which is provided with teeth, the other being smooth. This bar can be swung to either of two positions so that the teeth of one side will engage the teeth of the roller and hold the roller against movement, or it can be swung against the smooth side, in which case the roller and consequently the entire curtain can be moved up and down.

Upon pulling the curtain or shade 12 to unwind the same from the shade roller, the latter moves upward, provided it occupies a position at a point below its normal or topmost position with reference to the window. When the shade roller is automatically actuated by its cooperating spring to wind the curtain or shade 12 thereon, the result is to cause the shade roller to lower, or move downward, since it turns to the left and the teeth of the pulleys 1 and 4 meshing with the teeth of the bars 2 and 5, effect a lowering of the shade roller. When the shade roller has reached the required position, the movement of the bar 8 upon its pivots to throw its toothed portion 9 in engagement with the teeth 6 of the pulley 4, results in securing the shade roller in the adjusted position, it being understood that the pulley 4 is positively gripped upon opposite sides between the toothed portions of the bars 8 and 5.

Bolt Anchor.

A unique device for holding an embedded or buried nut in position to always properly receive a bolt, has been patented by Mr. Charles F. Lancaster, of Petoskey, Mich. A sleeve or barrel 1, having a box or nut retaining portion 2, is employed.



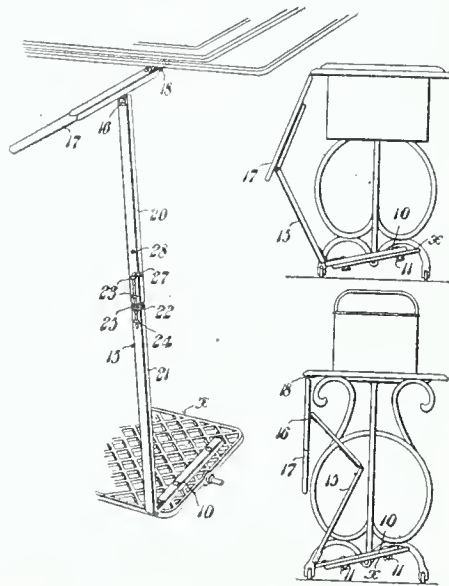
These are preferably formed as integral parts of a single strip of sheet metal, which has its central portion bent to form the box, the ends being extended parallel with each other, and each formed with a longitudinal ridge, that together form the sleeve. The metal on both sides of the ridges constitute wings that abut against each other. In using the device, the nut is first inserted into the box from either open end. The bolt is then inserted into the sleeve, and the edges of the thin metal forming the box are then crushed down over the nut so as to securely hold it in place. The entire device with the nut in it is then inserted in place, being embedded as desired.

This device will be found useful in concrete work where it is desired to bolt timbers to a concrete wall, after

the wall has been finished. In such event, after the nut has been secured in the box, the sleeve is placed in the finished concrete with the end towards the head of the bolt, flush with the surface of the wall. The device will also be found useful in connection with knock down furniture or implements which employ an embedded nut; in fact under every condition in which it is essential that an embedded nut be held rigidly in a position to always receive a bolt.

Hand Attachment for Sewing Machines.

Those who have occasion to use sewing machines for long periods of time and who become foot weary from constant operation of the treadle, will

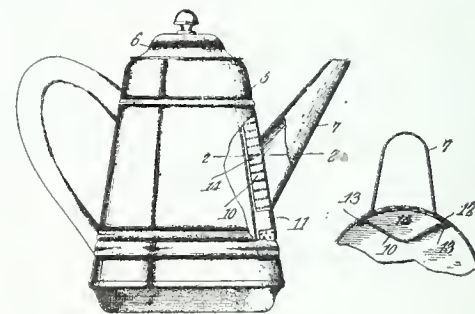


be interested in the invention recently patented by Mr. Thomas A. Teate, of Thomasville, Ga., on an attachment which can be applied to any sewing machine, so as to permit such machine to be operated by hand. A one-fourth interest in the patent has been assigned to each of the following gentlemen, namely, Messrs. Clyde N., Elijah L., and Herbert A. Neel, of the same place. As shown in the accompanying illustration, the attachment consists of a hand lever 17, which is adapted to be secured by a hinge 18 to the under side of the machine table. A bar 10 is secured to the treadle, and this bar is connected to the lever 17 by a link that is composed of sections 20 and 21 hinged respectively to the bar and lever and to

each other. A bolt 27, slidably mounted on one section, is arranged to detachably engage the other, and thus hold the sections against pivotal action when the device is to be used. If the machine is to be operated by hand, the sections 20 and 21 of the link are locked against relative movement, and thus by moving the end lever 17 up and down, the treadle will be operated. To place the lever out of the way, it is only necessary to unlock the sections 20 and 21 of the link, whereupon they may be swung inwardly under the machine, and the lever will drop out of the way.

Coffee or Teapot Strainer.

A removable strainer for teapots and similar vessels constitutes the subject matter of a patent recently granted to Frederick N. Martindale, of Gouverneur, N. Y. The device is in the form of an attachment which can be readily soldered to the inside of a coffee or teapot. It consists of a frame preferably stamped or otherwise formed from a single piece of metal, and comprising spaced longitudinal guide strips 9, connected by an integral web. This is secured inside of the vessel in line with the outlet to the spout. The strainer is formed of a single piece of wire fabric, preferably metal or other suitable material, bowed and having its opposite margins offset slightly to produce flanges 13 that slide in the guideways of the supporting strips. It will be



noted that the intermediate bowed portion of the strainer causes the opposite longitudinal edges of the flanges of said strainer to yieldably engage the walls of the guide flanges 9, and thus assist in supporting the strainer within the tea-pot.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

AMERICAN ACETYLENE BURNER CO. v. KIRCHBERGER et al.

(Circuit Court of Appeals, Second Circuit.
May 22, 1906. 147 F. R. p. 253.)

PATENTS—INVENTION—ACETYLENE GAS BURNERS.

The Shaffer patents, Nos. 617,942 and 634,-
888, for acetylene gas burners, are void for
lack of invention.

CUTLER-HAMMER MFG. CO. v. UNION ELECTRIC MFG. CO. et al.

(Circuit Court, E. D. Wisconsin. June 2,
1906. 147 F. R. p. 266.)

1. PATENTS—VALIDITY—INSERTION OF NEW CLAIM IN APPLICATION.

The fact that a new claim was inserted in
an application for a patent by the attorney
for the applicant without any new oath does
not render the patent invalid as to such
claim, where it was within the invention
described in the specification.

2. SAME—MISTAKE IN DRAWING.

The drawings of a patent are addressed
to those skilled in the art, and must also be
considered in connection with the claims
and specification and with each other; and
a patent is not invalidated by a clerical
mistake in a drawing, which, when so con-
sidered, would not mislead one skilled in
the art to which it relates.

3. SAME—INFRINGEMENT—ELECTRIC SWITCH FOR MOTORS.

The Blades patent, No. 418,678, for an
electric switch for motors was not anti-
cipated, and discloses patentable invention.
Claims 1 and 4 also held infringed by the
device of the Keeney and Rhine patent, No.
777,637, which, while it may embody im-
provements, contains the material features
of the earlier patent.

4. SAME—CONTRIBUTORY INFRINGEMENT.

A defendant which manufactures and sells
certain elements of a patented combination
with intent that they shall be used as a part
of the full combination, as well as in other
combinations, is chargeable with contributory
infringement in so far as its sales are
for use in the patented combination.

5. SAME—INVENTION—ELECTRIC RESISTANCE COIL.

The Baker patent, No. 368,807, for an elec-
tric resistance coil, is void for lack of pat-
entable novelty and invention.

ROBERT H. INGERSOLL & BRO. v. SNELLENBERG et al.

(Circuit Court, E. D. Pennsylvania. October
6, 1906. 147 F. R. p. 522.)

PATENTS—INFRINGEMENT—RESTRICTIONS ON SALE OF ARTICLE—RIGHT OF LICEN- SEE TO IMPOSE.

An exclusive license to sell a patented ar-
ticle, granted by the owner of the patent
who is also the manufacturer of the article,
does not vest the licensee with the right to
impose a valid restriction upon the future
selling price of the article under penalty of
liability for infringement of the patent.

WILLS v. SCRANTON COLD STORAGE CO.

(Circuit Court, M. D. Pennsylvania. July 14,
1906. 147 F. R. p. 525.)

1. PATENTS—INFRINGEMENT.

Upon the question of infringement the
structure itself is to be looked to and not
the results obtained, except as they may go
to the question of identity, and infringement
is not avoided because the patented device
is not utilized to the full extent possible nor
because a feature is retained which might
be dispensed with to advantage and which
it was one of the purposes of the patented
device to render unnecessary.

2. SAME—INVENTION—UTILITY AS EVI- DENCE.

The utility of a patented device is not
necessarily a proof of invention.

3. SAME—PATENTABLE INVENTION—WHEN NOTICE TAKEN OF WITHOUT PROOF.

Even though the point is not made in the
proofs that the device does not disclose pat-

entable invention, it is not to be disregarded
when it is plain.

4. SAME—INVENTION.

The Wills reissued patent No. 12,300
(original No. 742,540) for a refrigerator
building, the essential feature of which is a
device to prevent drafts up and down ele-
vator shafts in such buildings, is void for
lack of invention, the advantages being so
manifest and the means used for obtaining
them so obvious that only mechanical skill
was required to supply them.

PLECKER v. POORMAN.

(Circuit Court, S. D. Ohio. W. D. April 3,
1905. On Rehearing, September 14, 1905.
147 F. R. p. 528.)

1. PATENTS—SUIT FOR INFRINGEMENT— LACHES.

The owner of a patent is not barred by
laches from maintaining a suit in equity for
its infringement because of a delay of six
years in bringing such suit after the alleged
infringement commences where it appears
that during such time another suit was
pending for infringement by a machine sub-
stantially the same as defendant's.

2. SAME—INFRINGEMENT—CORRUGATING MACHINE.

The Plecker patent, No. 473,019, for a cor-
rugating machine claim discloses patentable
invention in the seaming roll therein de-
scribed. Also held infringed. Claim 8 is
void for lack of invention.

3. SAME—RECOVERY IN PART—DISCLAIMER.

Where, in a suit for infringement of a pat-
ent, one claim involved is held valid and in-
fringed, and another void for lack of inven-
tion, while under Rev. St. § 973 [U. S. Comp.
St. 1901, p. 703] the complainant cannot re-
cover costs unless a disclaimer is filed as to
the claim adjudged invalid, such disclaimer
will not be required as a condition prece-
dent to the recovery of profits or damages
for infringement of the valid claim.

PLECKER v. POORMAN.

(Circuit Court, S. D. Ohio. W. D. April 3,
1905. 147 F. R. p. 530.)

PATENTS—INFRINGEMENT—MACHINE FOR SHAPING SHEET METAL PIPES.

The Carr patent, No. 402,140, for a ma-
chine for shaping sheet metal pipes, is
limited by the action of the Patent Office, in
which the patentee acquiesced, to the spec-
ific construction of frame described. As
so limited, held not infringed.

AUTHORS & NEWSPAPERS ASS'N v. O'GORMAN CO.

(Circuit Court, D. Rhode Island. July 23,
1906. 147 F. R. p. 616.)

1. COPYRIGHT—BOOKS—RESTRICTED PUBLICA- TION—NOTICE.

Where the owner and publisher of a copy-
righted book sold copies thereof containing
a notice restricting the purchaser's title, and
requiring that the same should not be sold
prior to August 1, 1907, such notice did not,
without communication to the purchaser, be-
come a part of the contract of sale so as to
bind the purchaser with its provisions.

2. PRINCIPAL AND AGENT—SECRET INSTRU- CTIONS—SALES AGENT.

Where the owner of a copyrighted book
placed copies thereof in the hands of an
agent for sale, he thereby clothed the agent
with apparent authority to give complete
title to the copies sold, so that buyers were
not bound by secret instructions to such
agent, restricting the title he was authorized
to pass, which were uncommunicated.

3. CONTRACTS—RESTRAINT ON ALIENATION PUBLIC POLICY.

A provision in a contract for the sale of a
copyrighted book that it should not be re-
sold prior to August 1, 1907, or offered or
advertised for resale, was not contrary to
public policy.

4. INJUNCTION—PRELIMINARY INJUNCTION— ISSUANCE.

Complainant issued and sold a copyrighted
book only through authorized agents, who
were permitted to sell only at retail at 50
cents per copy on the express condition that
the books should not be resold prior to
August 1, 1907, etc. Each of the books also
contained a "notice to purchaser" reciting
such restrictions. Defendant, with
knowledge of complainant's plan of sale and
the restrictions placed thereon, instigated
the purchase of 55 copies of the book, which
it proceeded to sell in violation of the re-
strictions, at a probable loss, for 49 cents.
Held, that complainant was entitled to a
preliminary injunction restraining such sale
pendente lite.

GATES IRON WORKS v. OVERLAND GOLD MIN. CO.

(Circuit Court of Appeals, Eighth Circuit.
Sept. 3, 1906. 147 F. R. p. 700.)

1. PATENTS—INVENTION—STONE CRUSHERS.

The Hoyt patent, No. 525,419, for an im-
provement in gyratory stone crushers, which
consists only in making the hopper in two
annular sections and so supporting the outer
section that the inner one may be lifted out
independently of the other to facilitate the
making of repairs in the interior of the
crusher, instead of making it in a single
piece or in radial sections as previously
done, is void for lack of invention; only
mechanical skill and experience being re-
quired to devise such improvement.

2. SAME.

The Gates and Capen patent, No. 616,659,
for an improvement in gyratory stone
crushers, covers only a mere detail of con-
struction, within the domain of mechanical
skill, and is void for lack of invention.

SCHWEICHLER v. LEVINSON.

(Circuit Court of Appeals, Seventh Circuit.
August 11, 1906. 147 F. R. p. 704.)

PATENTS—INVENTION—COAT PAD.

The Schweichler patent No. 615,500 for a
coat pad is void for lack of invention, the
only feature of the device which the pat-
entee is entitled to claim as original, in view
of his acquiescence in the rejection of prior
claims by the Patent Office, being a shoulder
extension integral with the pad which does
not involve patentable invention in itself nor
constitute a true combination in connection
with the old part, but merely its enlargement
or the uniting in one of two parts which had
previously been sewed together.

KUHLMAN ELECTRIC CO. v. GENERAL ELECTRIC CO.

(Circuit Court of Appeals, Seventh Circuit.
August 11, 1906. 147 F. R. p. 709.)

1. PATENTS—VALIDITY—UNANTICIPATED ADVANTAGES OF INVENTION.

A patent will not fail because the princi-
pal advantages of the invention prove to be
different from the one chiefly in the pat-
entee's mind, if there be in the concept an
actual advantage and the structure embody-
ing it discloses patentable invention.

2. SAME—INFRINGEMENT—ELECTRICAL TRANSFORMER.

The Dobrowsky patent, No. 422,746, for
an electrical transformer was not anti-
cipated, and discloses patentable invention.
Also held infringed.

BIRDSBORO STEEL FOUNDRY & MA- CHINE CO. v. KELLEY BROS. & STIELMAN.

(Circuit Court of Appeals, Third Circuit.
August 3, 1906. 147 F. R. p. 713.)

1. EQUITY—BILL OF REVIEW—DILIGENCE IN DISCOVERY OF EVIDENCE.

In case of a bill of review, based upon
after-discovered evidence, the question of
diligence is necessarily a preliminary one,
to be considered and passed upon at the
time application is made for leave to file the
bill. Having been once disposed of when
the bill is allowed, it will not be again con-
sidered, and a denial in the answer of the
avertment of diligence made in the bill raises
an immaterial issue.

2. PATENTS—ANTICIPATION—COIL CLASPS FOR BELTS.

The Jackson patent, No. 433,791, for a coil
clasp for uniting the ends of belts, etc., is
void for anticipation, so far as it relates to
belts, by a device long used in paper-making
machines for uniting the ends of belt pulp
conveyors.

GENERAL ELECTRIC CO. v. CROUSE- HINDS ELECTRIC CO.

(Circuit Court, N. D. New York. October 8,
1906. 147 F. R. p. 718.)

PATENTS—SUIT FOR INFRINGEMENT—COSTS ON PARTIAL RECOVERY.

Rev. St. §§ 973, 4922 [U. S. Comp. St. 1901,
pp. 703, 3396], which provide that a plaintiff
or complainant recovering judgment or de-
cree for infringement of part of a patent
shall not recover costs where the claims of
the patent were too broad, and no disclaimer
was entered before suit, apply to a suit in
which certain claims of a patent are held
valid and infringed, while other independent
claims, infringement of which is alleged, are
held invalid, and in such case the complain-
ant is not entitled to recover costs.

BALL BEARING CO. v. STARR BALL RETAINER CO.

(Circuit Court, E. D. Pennsylvania. August
2, 1906. 147 F. R. p. 721.)

1. PATENTS—INFRINGEMENT—BALL BEARINGS.

The Simonds patents, No. 449,968 and No.
449,959 each for an improvement in ball bear-
ings, construed, and, as limited by the prior
art to the precise structure shown, are neither
of them infringed by the device of the
Keiper patent, No. 686,617.

2. SAME—TESTS OF INFRINGEMENT—INTER- CHANGEABILITY.

The interchangeability in use of two de-
vices is an important test in determining the
question of infringement.

AMERICAN MERCERIZING CO. et al. v. HAMPTON CO. et al.

(Circuit Court, D. Massachusetts. August 7,
1906. 147 F. R. p. 725.)

PATENTS—ANTICIPATION—PROCESS FOR MER- CERIZING FABRICS.

The Thomas & Prevost patents, Nos. 600,
826 and 600,827, for processes of mercerizing
vegetable fibers and fabrics are void for
anticipation by the Lowe English patent,
No. 4,452, of 1890.

GRAY v. GRINBERG et al.

(Circuit Court, E. D. Pennsylvania. October
8, 1906. 147 F. R. p. 732.)

PATENTS—SUIT FOR INFRINGEMENT—JURIS- DICTION IN SUIT AGAINST NONRESIDENT.

Evidence considered, and held not
sufficient to sustain the burden of proof rest-
ing on a complainant, in a suit for infringe-
ment of a patent against a nonresident de-
fendant, to show an actual sale of an in-
fringing article by defendant within the dis-
trict which was essential to give the court
jurisdiction.

CUSHMAN & DENISON MFG. CO. v. DENNY.

(Circuit Court, S. D. New York. July 17,
1906. 147 F. R. p. 734.)

PATENTS—INVENTION—WIRE PAPER CLIP

The Kelley patent, No. 761,635, for a wire
paper clip comprising two triangular-shaped
bodies having a base line in common is void,
for lack of patentable invention in view of
the prior art.

UNITED STATES FASTENER CO. v. WERTHEIMER et al.

(Circuit Court, S. D. New York. July 19,
1906. 147 F. R. p. 736.)

PATENTS—INVENTION—GLOVE FASTENER

The Douillet patent, No. 440,020, for the
socket member of a glove fastener having a
head of pearl or other material, is void for
lack of invention, in view of the prior art,
which showed the same construction of a
button having a sheet-metal head.

CONSOLIDATED RUBBER TIRE CO. et al. v. FIRESTONE TIRE RUBBER CO.

(Circuit Court, S. D. New York. July 20,
1906. 147 F. R. p. 739.)

PATENTS—INVENTION—RUBBER TIRE WHEEL.

The Grant patent, No. 554,675, for a rubber
tired wheel, discloses invention and is valid;
the rocking or tilting of the tire when com-
pressed on either side being an inherent
function, when the tire is made in accord-
ance with the directions of the patent. Also,
held infringed.

BREDIN v. NATIONAL METAL WEATHERSTRIP CO.

(Circuit Court, W. D. Pennsylvania. August
11, 1906. 147 F. R. p. 741.)

1. JUDGMENT—CONCLUSIVENESS—PATENTS— SUIT FOR INFRINGEMENT—CONCLUSIVE- NESS OF PRIOR ADJUDICATION

A decree in a prior suit for the infringe-
ment of a patent is none the less conclusive
between the parties on the issues of validity
and infringement because it was merely in-
terlocutory, when the second suit was com-
menced, where it is set up therein as an ad-
judication by a supplemental bill, after hav-
ing ripened into a final decree.

2. PATENTS—RIGHT TO LEAD A PRIOR DECREE OBTAINED PENDING SUIT.

The owner of a patent, who has obtained
an interlocutory decree adjudging its valid-
ity and infringement, is not required to wait
until it has become final before bringing suit
against the defendant for infringement by
the same device in another district; nor is he
precluded, by the fact that evidence has
been taken in the second suit, from pleading
therein the final decree when obtained in the
first suit as an adjudication.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Henry J. Park and Ferdinand H. Ries, Houston, Tex. Pump.—The pump of this patent is of that class which employs one or more rotary propellers for lifting water, and it is designed for operation in either bored or dug wells, being capable of lifting water the desired height at the expenditure of a minimum amount of power. It comprises a shaft, a propeller mounted on the shaft, a combined guide and bearing consisting of a spider mounted within the casing and provided with a tubular shaft receiving portion, a lower packing arranged on the flange, a bushing located within the tubular portion and receiving the shaft, an upper packing located above the bushing, and a cap arranged on the upper end of the tubular portion. The pump is provided with means for excluding water and sand from the bearings of the rotary shaft.

Victor E. Gustus, Kiron, Iowa. Poultry Roost.—It is the aim of this invention to provide a poultry roost adapted to be readily applied to a poultry or hen house, and enabling the perch bars to be folded out of the way to afford free access to the poultry or hen house in cleaning the same. The perch bars can be readily rotated to present both their side faces and edges for cleaning, and can be swung downward to a vertical position to facilitate the removal of accumulation of matter. The device comprises a plurality of perch bars, means for pivotally and hingedly mounting the perch bars at one end thereof, and means for detachably holding the perch bars at the other end thereof.

Christopher Warneke, Readlyn, Iowa, inventor; William Grant McKeowan, Readlyn, Iowa, assignee. Fence Post.—The invention relates to fence posts designed for use in wire fences, and capable of detachably securing a plurality of fence wires and of permitting the same to be removed when desired. The fence post has a locking member provided with a number of wire-receiving bends, arranged at intervals and adapted to be opened and closed successively, when the locking lever is swung outward and inward, whereby the fence wires may be applied to, and removed from, the fence post, one at a time. The locking member is pivoted at one end to the post, and its other end is bent at an angle and arranged in an opening of the post. Means are provided for engaging the bent end of the locking member for detachably securing the same in the opening of the post.

Isaac M. Larkey, Kibby, Okla. Game Apparatus.—It is the aim of the inventor to provide a game apparatus adapted to permit a new variety of scientific games to be played, and to afford amusement of a high order. The playing pieces vary in value as the game proceeds, and they also vary in form to correspond to different games. The apparatus embodies a gameboard provided with an outer rectangular field divided into squares, and an inner rectangular field arranged within the outer field, and having its corners located at the centers of the sides of the outer field. The inner field is thus divided into squares of less area than the squares of the outer field, the squares of the inner field being intersected diagonally by the sides of the squares of the outer field, and all of the lines of the squares of both fields running continuous and straight

throughout the area of their respective fields. The color of the lines of the inner field contrast with the color of the lines of the outer field.

Thomas L. Metcalfe, Hopkinsville, Ky.—Shipping Hamper for Laundries. The object of the present invention is to provide a clothes hamper designed for use by laundries for shipping clothes, and adapted to be thrown out of a wagon or express car without damaging it. It consists of a barrel provided at the bottom with an inwardly-inclined chime, and runners fitted against the bottom of the barrel and having terminal chime-receiving recesses, forming at their inner walls projecting portions, which are wedged within the chime at opposite sides of the barrel, whereby the runners are interlocked with the same.

John N. Sisley, Connellsville, Pa., inventor; The Knockdown Box Company, Connellsville, Pa., assignee. Knockdown Box.—The knockdown box of this invention affords a firm structure when set up, and is also capable of being compactly folded when not in use. It comprises a body provided with upwardly projecting side flanges, ends fitted against the end edges of the bottom and having upwardly extending top and bottom flanges, sides interposed between the side flanges of the bottom and the side edges of the ends of the box, and provided at their inner edges with inwardly extending flanges overlapped and arranged on the outer faces of the ends of the box, and a top or cover interposed between the ends of the box and provided with side flanges overlapping and detachably engaging the outer faces of the sides of the box. The top or cover is composed of hinged sections adapted to be arranged at an angle to enable them to be engaged with the top flanges of the ends of the box.

Whiting G. Nelson, deceased, inventor; Francine M. Nelson, Greenville, Mich., assignee. Bedstead.—The present invention has for its object to improve the construction of corner fastenings for metal bedsteads, and it is adapted to permit the side rails of a bedstead to be reversed, in order that the horizontal flange may be arranged either at the top or bottom of the side rail, whereby any form of bed spring may be used. It lessens the weight of a bedstead without reducing the strength, and it enables the parts to be rapidly assembled and separated, so that bedsteads may be handled, packed and shipped with greater convenience than heretofore. The corner fastening is provided with a clamp, composed of an angle side rail having its vertical flange extended beyond the horizontal flange to form a fixed clamping jaw, and an angle plate having vertical and horizontal flanges to fit the side rail and provided with a jaw co-operating with the jaw of the side rail, and means for adjustably connecting the jaws.

Robert H. Waller, inventor; Max Benz and Neely Porch, assignees, Nashville, Tenn. Pen Holder.—It is the aim of the present invention to provide a pen holder, adapted to be operated with one hand to remove a pen, and enabling a pen to be quickly inserted in place. The movement for ejecting the pen will assist in freeing the same should there be any corrosion. The pen holder comprises a handle, a tubular pen-receiving barrel provided with a slot, and a flat bar or member rigid with the handle and pivoted to the barrel and operating through the slot. The side faces of the bar or member are spaced from the curved sides of the barrel, and the said bar or member and the barrel co-operate to form a spring clamp for holding the pen. The pressure inci-

dent to the use of the pen holder will operate to lock the pen in position, and will effectually prevent the pen from becoming accidentally released when in use.

Harry C. Rush, Dawson, Pa., inventor; James S. Laughrey and Phil C. Moore, Dawson, Pa., assignees. Two patents. Railway Switch and Step Ladder.—The first patent covers a railway switch, designed particularly for use on railways employing the third rail system, and capable of operation either by hand, or by switch operating devices mounted on a locomotive, motor car, or the like. It is provided with an automatic lock capable of securely holding the movable switch rails and a movable third rail section to prevent any accidental movement of the parts. It releases the parts prior to the operation of the switch and relocks the parts as soon as the switch has been operated. The railway switch embodies movable switch rails, a movable third rail switch, a rock shaft, a reciprocating bar connected with the rock shaft, bell crank levers connecting the bar with the switch rails and the movable third rail switch, a latch for locking the switch rails and the third rail switch, switch operating arms connected with the rock shaft, a rock shaft connected with the latch and provided with latch releasing arms located above the switch operating arms, and means for holding the latch normally in its engaging position. The operating devices, which are mounted on a locomotive, car or the like, consist of resilient plates or bars arranged in pairs, operating levers, links connecting the levers with the resilient plates or bars, keepers arranged in the paths of the levers, and a tripping device arranged to be operated by either of the levers for disengaging the other lever from its keeper.

The second patent is directed to a step ladder adapted, in addition to performing the function of an ordinary step ladder, to be used with perfect safety on sloping ground, stairways and other uneven surfaces. The leg of the step ladder is adjustable and comprises an upper section having an extended cross bar, a lower section provided with upwardly converging outer bars and having inner parallel bars slidably connected with the upper section, means for securing the sections in their adjustment, and foldable braces connected with the ends of the extended cross bar. The step ladder is also provided with a hinged shelf, which is maintained in a horizontal position by a pivoted support, having a pintle rod extending longitudinally of the leg and provided with arms, arranged at an angle to each other, for limiting the swing of the pintle rod.

John A. Smith, Creede, Colo., inventor; Henry H. Wason, Amethyst, Colo., assignee. Separating and Sizing Attachment for Concentrators.—This invention has for its object to completely separate the values as they fall from the discharge end of the table, and to properly size or grade the middlings in order to facilitate the concentration when said middlings are again passed over the table. It comprises angular supporting brackets, a pair of guide rods carried by the brackets, a rectangular screen frame having its end bars apertured for the reception of the guide rods and having a series of openings in its side bars, a middlings trough supported by the frame at one end, trough retaining devices engaging said openings, a screen mounted on the frame at one side of the middlings trough, and a values trough secured to the frame and extending beyond the opposite side of the middlings trough.

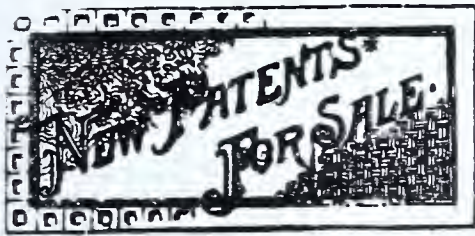
Henry H. Urquhart, Paducah, Ky., inventor; James Weille, Paducah, Ky., assignee. Brake Shoes for Loco-

motive.—The brake shoe of this patent may be readily inspected, and is effectually prevented, when worn, from flying off and wrecking or otherwise injuring a locomotive. In event of the derailment of an engine, it may be quickly removed to prevent it from being injured when the engine is replaced on the rails. The device embodies a brake block or head, a brake shoe provided in its rear face with a recess receiving the brake block or head, said brake shoe being provided at the said recess with side and end walls, whereby it is held against lateral and longitudinal movement, and means for securing the brake shoe to the brake block or head, said means being located in rear of the brake shoe to permit the latter to be worn out without affecting the securing means.

Richard P. Rodgers, Spartanburg, S. C. Plows.—This invention provides a plow in which a single bolt will securely fasten the shovel or blade and the heel-sweep to the foot or standard. It consists of the foot or standard having an opening, a cultivator blade or shovel fitted against the front of the foot or standard and provided with a bolt opening, and having a projecting lug or flange fitting within the opening of the foot or standard, a heel-sweep having an opening and also provided with a lug or flange extending into the opening of the foot or standard, and a heel-bolt passing through the opening of the foot or standard and through the opening of the blade or shovel and the heel-sweep. The lugs or flanges are arranged to prevent the cultivator blade or shovel and the heel-sweep from turning on the heel-bolt.

Albert Hailey, Ruston, La., inventor. Two patents. Baling Presses. W. B. Mullen, Portland, Texas, assignee of one-half interest in the first patent.—It is the aim of the first invention to provide a baling press, adapted to be operated by horse power, and designed for baling hay, cotton, rags and other material. It embodies a baling box, and a frame, a plunger beam, a pivoted arm, pulley blocks attached to the frame, a cable secured to the plunger beam and arm and passing through said pulley blocks, whereby the said plunger beam and arm are constrained to move simultaneously; a curved guide, a stud carried by the plunger beam and arranged to travel on the guide to direct the outer end of the plunger beam to the median line of the said frame, a revolving sweep having a cross bar adapted to engage the plunger beam to force the same into the said box, the pivoted arm and the cross bar having different centers of revolution, and studs carried by the cross bar and arranged to actuate the pivoted arm, whereby the plunger is withdrawn from its outermost position by the cable.

The second patent is directed to that class of baling presses employing reciprocable plungers and rotary sweeps for actuating the same. It is adapted to dispense with the guiding means usually employed for the plunger, and the flexible connection frequently provided for connecting the plunger with the means for moving it outward from the press box or chamber. It embraces a reciprocable laterally movable plunger beam, a sweep provided with means for engaging the plunger beam to move the same inward, an oscillatory arm or member connected with the reciprocable plunger to cause the same to move laterally in the arc of a circle, and an oscillatory lever connected with the plunger beam and arranged to be engaged by the sweep to move the plunger beam outwardly.



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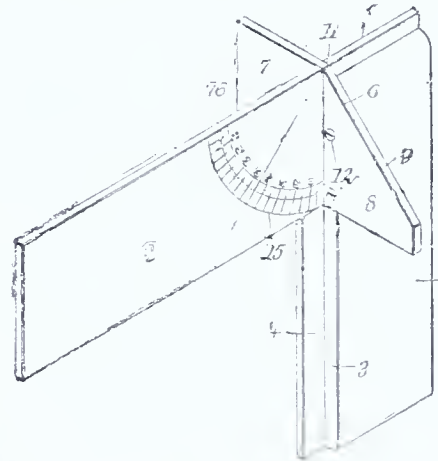
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WASHINGTON, D. C. OCTOBER, 1907.

Patents in the Philippines.

Inquiries reach this office from time to time in regard to the protection afforded by a U. S. patent in Hawaii, Porto Rico and the Philippines. Since there seems to be very little general information in regard to this subject, we would explain that so far as Porto Rico and Hawaii are concerned, no additional protection is necessary, as both are territories and come under the United States patent laws. In the Philippines, however, there is a different procedure. To obtain protection in these islands for patents, trademarks or copyrights, copies of the same should be sent to the Executive Secretary at Manila, with one dollar for registration fee. The Philippine Internal Revenue law also requires a ten cent revenue stamp in such cases, and this amount should accompany the application for registration.

Coalite—A New Fuel.

Much interest has been aroused in England in a new fuel, to which the name coalite is given. It is a bright, hard substance, similar in appearance to the best coke, and in burning it makes no smoke, and gives off, it is claimed, twice the heat of coal. The fire lasts much longer. The coalite is produced by a process similar to that employed by the gas companies for the production of coke. To obtain the latter, coal is treated at a high temperature, the gas and by-products are collected and the residue is coke. By the new process, the coal is treated at a much lower temperature, and the gas and by-products are richer. Coalite can be easily lighted, and burns with great steadiness and economy. For household purposes it would seem to have a special value, in virtue of its cleanliness and its heating power. This is fully recognized in London, where the prospect of abating the smoke and fog nuisance is hailed with satisfaction. The king has been impressed with its qualities, and instructions have been given at Buckingham palace to have the cellars swept clear of all coal and

nothing but coalite put there for the future. Out of a ton of coal about 70 per cent of coalite is extracted, but as its calorific power is much greater, the ton may be said to have suffered no loss in value, while at the same time the gas and by-products have been extracted.

Analysis of the new fuel shows it to be coal from which the smoke-forming constituents have been separated, leaving enough hydrogen producing matter to ensure easy ignition and free burning, so that the heat of combustion, instead of having to do the work of decomposing and volatilizing the hydrocarbons and the water produced by the combustion (as with bituminous coal) is largely generated as sensible heat. The process consists in carbonizing coal for a period of eight hours in flat retorts which are placed vertically in a gas fired furnace with a temperature of 800 degrees. These retorts being filled with coal, the swelling of the coal on heating causes a considerable pressure and results in the formation of a product of good density, while the low temperature prevents the whole of the volatile matter from being expelled and yields a substance which, although it has a superficial resemblance to coke, differs widely from it in many important points.

A Railroad in Cloudland.

The highest railroad in the United States, and with one exception the highest actual railroad in the world, was opened a few months ago in Colorado. It climbs up one of the shoulders of Gray's Peak—which is higher than Pike's Peak—until it reaches the imposing altitude of 14,000 feet above sea level.

There is a railroad in Peru which crosses a pass in the Andes some 500 feet higher than this road; and the cog railway up Pike's Peak is also higher, as it goes to the summit of the peak, while this new road lacks 200 feet of scaling the mountain which it climbs; but a cog railway is not a railroad in the strict sense of the word, as it relies on something more than steam power for its operation. This new road is 400 feet higher than the celebrated Jungfrau Railroad in Switzerland, which is the marvel of European engineers. Gray's Peak, which is one of the mightiest mountains on this continent, contains valuable minerals, and it is to develop these that the road was constructed.

To anyone but an expert, it would have seemed impossible to make the dizzy ascent out of the canyon where the road starts. The mountains on all sides rise sheer to a tremendous height. The track is laid at first in a series of switchbacks. The trains literally climb a flight of stairs until they reach the top of the valley. Then there are a number of tunnels, the grades averaging nearly 8 per cent, which means that the train climbs eight feet for every hundred it advances. The entire road averages a 6 per cent grade—something hitherto unheard of in railroad construction. The curves, which are so numerous as to leave the impression that there is not a straight rail in the entire length

of the road, average thirty degrees.

The railway serves for the transportation of ore, and its total length is only 15 miles. The mountain, at its terminus, is honeycombed with mine shafts, many of them deserted, for this was the first silver mine opened in Colorado. Ore from it was shipped across the plains by ox teams long before the first stage coaches were run. The pioneer miners, who were looking for silver only, had no idea they were working in a district which would some day be a great gold mining center.

Although the road, as noted, is only 15 miles long, it cost \$250,000. It is a narrow gauge, and every foot of the roadbed has been firmly ballasted. The engines are of the Shay-g geared type—a kind of engine that has been likened to Kipling's screw guns, which can "climb up the side of a sign board, and trust to the stick of the paint." The eight drive wheels are geared together, and the pulling power is enormous. And in case the engine should leave the track, it always leans away from the outer edge, so that it will not plunge into an abyss. This makes travel over the dizzy railroad absolutely safe.

The Gyroscope Railway.

Time was never held at such a premium as in these early years of the twentieth century. In every department of human labor, the motto is haste. A century ago time was reckoned in months—sometimes in days. Twenty five years ago, it was reckoned in hours; but today the great industries of this country count time by minutes, and inventive minds are endeavoring to effect means by which even seconds may be saved. A visit to the Patent Office will convince one that nearly three fourths of all the inventions are devices for saving time in some way. Time is the essence of all things, and the mania for speed, it has been said, is perhaps the greatest factor in the progress of the American people.

In no line of activity is this more true than in transportation. We cannot travel fast enough. Business men would like to breakfast in New York, lunch in Chicago and dine in San Francisco. A mile a minute quite fails to satisfy them. And although we can now traverse the continent in less time than it took George Washington to travel from his home at Mount Vernon to Philadelphia, on his historic journey to take the oath of office, the railroads are constantly striving to increase speed, to clip an hour off the schedule, to eliminate curves, to strengthen road beds, to use electricity instead of steam, and to employ every possible device to lessen distances. But in spite of all efforts, it would seem that as trains and railroads are now constructed, it is impossible to greatly accelerate speed. The German official experiments with rapid electric railways showed the limit that can probably be reached in that direction, and although the cars went at such a rate that they overtook and killed birds in flight, and at the end of the run the front of the train was covered

with dead gnats, bees, etc, which had been smashed by the impact, there are certain technical objections to the maintenance of such speed for general traffic. A hundred and twenty or thirty miles an hour was reached, and the same rate has been made by automobiles traveling under the most favorable conditions. But inventors are realizing more and more that in order to attain and maintain a uniformly high-rate of speed, some radical change in the method of transportation must be made. The single rail has often been suggested, and at the St. Louis Exposition there was shown a full-sized model of a car constructed to run on this railway, which it was proposed to establish between Liverpool and Manchester. And now comes Louis Brennan, the inventor of a self-steering torpedo which was bought by the British government for a large sum, with a car which is intended to be used on a single rail, and to maintain its balance on the principle of the gyroscope.

Most of us remember to have seen the gyroscope when we were children, and to have played with the toy—a rapidly revolving device that would spin on the edge of a table or travel down an inclined string without falling off. Sir Hiram Maxim has called the gyroscope a mechanical paradox; but it is this idea which Brennan uses in his new car, and experiments before the British Royal Society astounded the onlookers. It would seem ridiculous to base serious hopes upon this discovery if it were not for the scientific reputation of Brennan. It must also be remembered that it is unsafe, in this age, to be too incredulous. It has often happened that some principle of physics was employed for mere amusement for centuries before it was found to possess greater possibilities. Prof. Langley, formerly at the head of the Smithsonian Institution, modeled his aerodrome after a French flying toy, and it is said the Wright brothers have adopted the same idea. The magnet has been used for many years only for laboratory purposes, or as a plaything. It is now being utilized for raising great metallic weights. The Chinese for centuries employed gunpowder for making firecrackers, and only recently have learned a wider use for it. And the same is true of the gyroscope top.

A description of the new railway is given in another column, from which the possibilities of the invention, if it works as promised, are seen to be incalculable. The question of speed is not the only one involved, although it is estimated that the present rate could be doubled or tripled; but another striking feature of the new system would be its enormous saving in the cost of railway construction. Each track would consist of a single rail instead of two, and it would be needless to spend millions in the elimination of sharp curves and steep gradients. To cross rivers or ravines, it would not be necessary to build huge bridges of masonry or steel; the Brennan car would require only a structure to support a single rail, which need be little more than a very substantial wire rope. It is noteworthy that the British government is spending \$25,000 to build a monorail track and car so as to give a practical test to the matter. If it is successful, it will make Fast Flyers and Twentieth Century Limiteds as obsolete as the old time stage coach seems today.

New Light for Oculists.

A new contrivance, likely to be of service in eye diagnosis, is reported by the Academy of Science at Paris. Dr. Fortin has discovered that the light from a mercury vapor lamp, passing through two sheets of blue glass and reflected into the eye by a large lens, reveals the internal condition infinitely better than the ordinary light. By placing a screen with a pinhole between the light and the eye, a magnified image of the vessels at the back of the retina, which have been hitherto almost invisible, has been obtained. The capillary veins, the diameter of which is only two-thousandths of a millimeter, are seen to distend with each heartbeat, and it is even possible to count the blood globules.

Dry Seat for Cars.

To keep the outside seats of street cars dry during the wet weather is a problem for transportation companies. A recent invention prevents the rain running through the spars of the seat and wetting the under part, so that a dry surface may be obtained when the seat is reversed. The seat is constructed of spars mounted in a frame that can be turned over on pivots in the middle of, and within an outer fixed frame, so that when one side is wet the other can be brought uppermost. Two separate sets of spars are employed, one set for each side of the seat, with a plate between the two seats. This plate prevents the lower spars from getting wet, and the rain is carried off by holes in the sides of the seat frame. The pivoted seat may be held in position by means of a catch at the front or sides. The device seems simple and practical.

Electric Motor Drive.

During the past ten years very rapid development has been made in the operation of machine tools by electric motors. While still greater improvement may be looked for, electric drive has long since passed the experimental stage and its advantages have been well established. Up-to-date electrical equipment has been productive of great savings in providing for economical operation and enlarged output.

So many improvements are being made continually by the manufacturers of electrical equipment who are alive to their opportunities, that it would take more time to study the subject than the ordinary shop manager or superintendent has to devote to such matters. Because of the rapidity with which improved equipment supersedes the older apparatus, the textbooks are unable to keep up with the march of progress and the bulletins issued by the various manufacturing concerns, together with the technical journals, provide the most practical means whereby the busy shop manager may keep himself informed as to the latest types of apparatus.

There are many advantages to be gained by the use of electric drive, and while it is not intended to enter deeply into the discussion of this subject, some of the important features seem worthy of mention. It is just

about as cheap to put in direct connected machines as to install line shafts, counter-shafts, belting, etc. With the elimination of line shaft drive, the machines may be located in the shop as best suited to the requirements of the work to be accomplished and to facilitate the productive movement of material. The absence of belts provides freedom for the movement of cranes and hoists to serve the various machines, and improves the condition surrounding the machine operators by removing obstacles to the diffusion of natural light.

The greatest benefit derived from motor-driven tools is in the increased production obtained. The factors controlling the output of a machine require careful study and supervision and are more far-reaching than to include the machine alone. Output is dependent not only on the capacity of the machine and the ability of the operator to work the machine up to its capacity, but is further dependent upon a foreman who knows the capacity of the machine and has the ability to see that the operator works the machine to its capacity.

A further advantage of the motor drive lies in the speed control which permits the speed of the machine to be varied according to the requirement of the particular work at hand. At the same time, however, this speed variation should not be considered as providing variable speed for the same class of work. Its advantage rather lies in the means to enable a machine operator to start work at a speed which seems about right and to vary it in small or large increments until the maximum speed is obtained consistent with the depth of cut productive of best results. When the proper speed is depended upon, it should be followed and adhered to by the operator for the same class of work. An operator is much more likely to experiment with speed variations where the control is convenient than he is to shift belts from one step to another.—*Modern Machinery.*

Rusting of Fences.

Among the difficulties with which farmers have to contend is the rapid rusting of wire fences. The Agricultural Department has been making efforts to find the cause of this trouble, and in the course of its investigations, a discovery has been made which will probably be of great service. It has always been believed that it was the oxygen in the air that caused the rust, through a process of oxidation: it is now recognized that the difficulty is electrolytic, and is caused by hydrogen. When the air is damp the atoms of hydrogen, being electricified or ionized, attack the atoms of iron and cause rust. The cure is to coat the iron with some substance that will polarize it, and render it immune to the action of the hydrogen. Chromic acid compounds have been experimented with, and found to work perfectly. This is apparently contradictory, as chromic acid is a strong oxidizing agent; but it polarizes the iron, and so prevents rust. Some kind of paint containing this acid will probably soon be invented which will practically stop the rusting of fences and other iron work that is exposed to the air.

The Monorail.

The practical limit of speed on two rails, with an ordinary steam locomotive, has been long since reached. Sixty or seventy miles an hour, it has been shown by trains in this country and in Europe, can be maintained for a considerable distance, if the track is straight and the road-bed perfect. But this rate by no means satisfies the traveling public. The annihilation of space by means of electric locomotives, flying machines, and any other means known to science, is the object of twentieth century inventors. Every now and then a revolution in railroads is promised as the result of some new discovery, and the latest is through the application of the principle of a top.

An Irishman, Louis Brennan, has recently exhibited before the London Royal Society, a new kind of railway founded on the idea of the gyroscope, a scientific plaything invented a couple of centuries ago, and familiar to most children. The gyroscope is a sort of top, consisting of a wheel revolving rapidly on an axis, which can be tipped over horizontally without falling, as if in defiance of gravity. Every boy knows that the faster a top spins, the steadier is its balance. It is only when it revolves more slowly that it begins to oscillate. It seems absurd, at first glance, to apply this principle to railroading, but in the exhibit before the Royal Society, a single track was laid around the amphitheatre, and on this track a small car, about six feet square, was propelled by electricity at a surprising rate of speed. It rounded sharp corners without losing its equilibrium. When it was suddenly stopped, it stood immovable, upright, and with no oscillation. It was apparently impossible to upset the car; and no increase in speed affected its stability.

The explanation of this remarkable phenomenon is a simple one to mathematicians, now that it has been pointed out by Mr. Brennan. It involves the application to railroading, as above noted, of a double gyroscope, two large wheels revolving with great rapidity in opposite directions, in such a way that when one of them is depressed the other is depressed in precisely the opposite direction, thus securing an even balance. This imparts to the cars of the gyroscopic railway a steadiness so absolute that it cannot be disturbed. It is asserted that if two gyroscopic trains were to collide head on, they would both leap from their single track; but even then—if not smashed up—they would not be overturned, but would continue to run on over the sleepers, the rough ground, or any other obstacle. Even if their wheels should be broken off, the cars themselves would still remain in an upright position.

The two gyroscopes, as above described, are mounted in a vacuum under a glass case; ball bearings are supplied, and a thin film of oil to reduce the friction to a minimum. The car has four wheels, two at each end,

pivoted both vertically and horizontally so it can take short curves and travel over track or uneven ground without being derailed. The motive power—in this case electricity—may be gasoline or steam or any other force desired. The gyroscope attachment weighs but 5% of the total load, which would be about three tons for a 60 ton Pullman car.

The future possibilities of this invention can hardly be measured. Its balance being assured, there is practically no obstacle which it cannot surmount. A single rail may be swung across ravines or lakes. A single rail placed on piles can traverse equatorial swamps or the ruggedest of mountains. Along this monorail the train might fly across the chimney tops of cities: in fact, it has been called the half-way house to the kingdom of the air. There are, to be sure, difficult problems yet to be overcome in the working out of the invention, and scientists are divided as to the possibility of practical operation; but it is not too much to believe that this principle of the gyroscope can be utilized by man to great advantage, now that Brennan has pointed the way. The principle operates in the suns and planets that whirl through space above us, each in its own path and never deviating; and it would seem that human ingenuity might apply it to some more useful work than is seen in a mere plaything.

New Way of Making Foundations.

In and around Paris they have been using, with much success, a new system for putting foundations in unstable soil. The system is known as the compressol, and is described in the *Pathfinder* as consisting in making holes in the soft ground down to the solid earth with a pointed ram which is driven in like a pile-driver. After the solid earth is reached, layers of rubble are firmly rammed in, and what is practically a monolithic block is the result. Being rammed down with so much force, the rubble adheres firmly to the sides of the shaft and so can resist a great degree of lateral pressure. Another fine feature of the system is the fact that in making the shaft into which the rubble is rammed, no earth is removed, the pointed driver making the walls compact, so that the foundation cannot give way on the sides.

This system does not involve earth work of the usual kind, and no shoring of excavations has to be done. In foundations where wooden piles would be used, carrying a load of 25 tons, one compressol pile suffices where five or six wooden ones would formerly have been used. In case the earth where the compressol foundation is to be used is wet, clay is introduced into the hole from time to time, so as to make the walls water tight. The compressol piles throw the pressure, which the structure resting upon them exerts, directly upon the ground, and as many of them as are necessary to secure a strong foundation are driven in. When working under water the ordinary sheet piling structure may be dispensed with by substituting a cylinder of concrete, reinforced or not. The cylinder is let into the bed of the river and projects above the water level, the water it contains being removed by pumps. Then after the shaft has been sunk and filled in with the rubble and stones, the concrete cylinder can be filled.

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Linen and producing the same, Waterproof coated E. A. Clossmann
Linotype machine J. R. Rogers
Liquid meter J. W. Ledoux
Load trimmer F. H. Schlegelmilch
Loading and unloading apparatus F. B. Clark
Lock N. B. Hard
Lock A. N. Wickham
Lock C. Fisher
Lock and latch, Combined 2 pats W. H. F. Young
Lock protecting device C. E. Leighton
Log loader J. R. McGiffert
Loom filling detector mechanism J. T. Cyr
Loom protector mechanism M. Dumont
Loom shuttle J. Varley
Lubricating system J. F. McCanna
Magnetic switch J. L. Schureman
Mashing apparatus H. Heuser
Massage apparatus R. S. Sarver
Match box R. vom Cleff, Jr et al
Match box C. Nelson
Match boxing machine F. Eichler
Match scratcher T. R. Milligan et al
Mattress, Spring F. A. Loope
Measuring device G. F. Clark
Mechanical movement J. D. A. Johnson
Mechanical movement A. Wahle
Metal, Expanded G. A. Turnbull
Metal working dies H. K. Jones
Metals from ores or salts, Apparatus for electrolytic reduction of C. E. Robertson
Metallic tie and rail fastener R. M. McKinney
Metallic tie and rail fastener, W. A. Maitland
Milk receptacles, Interlocking locking attachment for P. Gallagher
Mine shaft safety device J. Wilson
Mirrors, &c. Frame for J. M. Courroy
Mitten or glove W. F. Hall
Mixing and measuring machine K. J. Sundstrom
Moistener, Stamp C. Neuer
Mold J. A. Rathbone
Molding machine A. & D. Heller
Mop head E. M. Lefevre
Motion converting device A. B. Cibak
Motor compressor W. L. Waters

Month wedge R. Buchfeld
Mower, Lawn C. E. Jackson
Muffler and stove, Combined W. C. Strang
Music holder J. B. Way et al
Music leaf turner L. J. Rose
Musical instrument, Self playing B. S. Dean
Musical instruments, Accentuating device for automatic C. S. Burton
Musical instruments and musical instrument players, Pneumatic operating device for B. S. Dean
Musical instruments, Operating mechanism for B. S. Dean
Nail clenching machine J. A. Milliken
Net, Fly W. Erdmann
Nose ring for animals H. Perkins
Notes, drafts, &c. Blank for J. W. Comer
Numbering apparatus O. G. Bartusch
Nut lock C. D. Logan
Nut lock and lock nut J. F. Hemmings
Oil atomizing apparatus L. V. Estes et al
Oil burner V. F. Lassoe et al
Oil separator J. B. Berryman et al
Oiling devices, Joint for telescopic F. J. Lane
Onion topping machine P. Jansen
Operating table J. H. Downey
Ore or sand concentrator F. A. W. Wells
Ore, Separating H. H. Wait
Ores, Treating L. M. Pritchard
Organ action, Pipe W. A. Sommerhof
Oscillating motor H. W. & J. E. Yost
Ovens, Fine construction for bake F. R. Bartheisel
Packing for rotary motors J. Wilkinson
Packing, Lubricant seal shaft J. W. Smith
Pad for suspenders and other articles F. R. Barchelder
Padlock, Keyless G. W. Kone
Paper box, Folding A. M. Rhodes
Paper box machine pasteurizer F. H. Taylor
Paper clip C. A. Shields
Partition construction, Apparatus for A. C. Raymond
Pavement construction, Brick J. M. Perkins
Pawl and ratchet mechanism, Mechanism for controlling the pawls in W. Trehwella
Perambulator or go-cart, Folding A. E. McGill
Percussive tool, Presser operated A. H. Gibson
Permutation lock C. E. Morris
Peroxides, Producing metal F. F. F. F. F.
Phonograph, graphophone, &c. C. G. Garrard
Phosphorus and calcium carbide, Manufacture of J. T. Morehead
Photographer's trimming wheel L. F. Smith
Photographic film G. Macaire
Photographic printing apparatus H. H. McIntire
Photographic printing apparatus H. V. Sillm-Jensen
Pianissimo device H. O. Clark
Piano players, Tempo controller for automatic J. W. Darley, Jr
Piano players, Valve for automatic A. Marino
Pianos and organs, Electrical keyboard heater and tone preserver for R. R. Turner et al
Pianos, Door and treadle operating means for self-playing J. L. Lutjen
Picture, Embossed F. Feher
Picture hanger H. N. Patrick et al
Pipe coupling J. Grindrod et al
Pipe coupling, Automatic train J. B. Genin
Pipe covering J. H. Wilson
Pipe joint, Adjustable P. Wagner
Pipe wrench D. F. Gates
Pipe, Plumbing waste M. K. Bell
Piston ring contractor O. Winter
Planimeter for measuring the areas of leather hides, &c. G. Coradi
Plastic composition M. P. Lanza
Plow E. D. Leet
Plow, Low lift D. Halloran
Pneumatic despatch tube apparatus I. W. Litchfield
Pneumatic despatch tube carrier E. G. Thomas
Pneumatic diaphragms, Apparatus for making M. S. Wright
Pocket knife A. G. Zimmer
Polishing wheel D. F. McGovern
Portable chair W. B. Frederick et al
Potato digging machine F. Schulze
Power transmitter J. C. Anderson
Precious metals from solutions, Recovering I. Anderson
Preserving fruits, &c. Apparatus for D. von der Leith
Pressure regulator A. Underwood
Printing machine H. A. W. Wood
Printing machine J. Owens
Printing mechanism F. G. Jahn
Printing press C. F. Buck
Printing presses, Arrangement for removal of rolls in G. P. Fenner
Propeller, Reversible A. B. Shultz
Prospecting tool T. Johnstone
Pruning shears W. H. Bradford
Pulleys, Forming sectional W. H. Lashaw
Pulling machine H. Bickel
Pulverizer W. S. Sharpneck
Pump, Automobile lubricating J. F. McCanna
Pump, Compound centrifugal E. W. Riggs
Pump, Pendulum power C. A. Kuehn
Pump, Rotary L. E. Young
Pump stop D. E. Rosser
Pumps, Device for automatically disconnecting power driven A. L. Olson
Punch and shear, Combined A. E. Durner
Punch, Multiple J. L. Brower
Punching mechanism, Jacquard card V. & V. E. Royle et al
Puttying device, Self feeding W. M. Brown
Rail fastening tie C. E. Burgess
Rail joint J. Marold
Rails, Resilient approach for rack N. D. Levin
Railway brake J. B. O'Donnell
Railway coupling N. Pavia et al
Railway cross tie T. W. Pitts
Railway rail brace H. Hemphill
Railway signaling device E. G. McGath
Railway spike O. C. Abrahamson
Railway switch, Automatic H. H. Hayes
Railway switch operating mechanism M. Field

Railway tie N. A. Glynn
Railway tie, Metallic 2 pats. J. G. Snyder
Railway tie, Metallic R. Fagan
Railway track safety block L. F. Learman
Railway train bumper A. L. Stanford
Range finder, Horizontal A. S. Swasey
Razor, Safety L. J. C. Astorgia
Reciprocating engine E. A. Rix
Recorder F. Graziano
Reduction and pulverizing mill A. C. Bates
Rein holder E. R. Ferrell
Rein holder I. Skinner
Relay and sonner G. W. Lorimer
Renovator, Pneumatic F. T. Snyder
Rheostat F. G. Jahn
Rivet, Split E. B. Stimpson
Roll positioning device E. B. Roth
Rolls, dies, &c. Finishing the surfaces of R. C. Totten
Rope carrier direction changing device F. V. Drake
Rotary engine W. L. A. Wright
Rotary engine C. D. Macropoulos
Rotary engine P. J. D. Kops
Rotary engine W. H. Hooker
Rotary engine E. T. Thomas
Rotary engine A. T. Beach et al
Rubbing and finishing machine J. R. Pierce
Rug and curtain holder A. C. Hawthorne
Rule, Measuring R. Breil
Ruling of lines, Mechanism for periodically interrupting the E. Weingartner
Saddle iron L. Adams
Saddle iron H. M. Underwood
Saddle iron T. Finko
Saddle iron, Electrically heated W. J. Barr
Saddle iron heater N. A. Westerlund
Safety pin W. B. Pritchard
Safety stop H. H. Brockhills et al
Salt press V. S. Hardy et al
Sash fastener D. R. Smith
Sash fastener G. M. Scott
Sash fastener A. H. Michaelis et al
Saw blades, Insertible teeth for C. A. Juengst
Saw setting implement C. C. Talbot
Sawing machine S. A. Phillips
Scalp treating apparatus R. E. Beaubien
Scissors holding device E. B. Toil
Scraper and leveler, Road R. A. Dinsmore
Scraper, Roll W. I. Hill
Screw thread cutting device C. Winckelmann
Sealing device, Box J. L. Burton
Sealing machine, Envelop F. H. Doolap
Separating pot G. Nebel
Sewer trap vent attachment H. I. Mibach
Sewing machine C. E. Hadley
Sewing machine, Blindstitching E. F. Fefel
Sewing machine cabinet W. C. Free
Sewing machine, Interchangeable lock and chain stitch E. J. Toef
Shaft key W. E. Landerbaugh
Shafting, Flexible E. F. Johnston
Shearing apparatus M. W. Hogle et al
Shears W. H. Dow
Sheet metal plates, Plant for bevelling the edges of D. O. Paige
Shingling gage D. W. Edson
Shipping box or crate 2 pats. J. F. Hitch
Shoe cleaner M. S. Hatch
Shoe shank H. Brennan
Shoe ventilating device C. R. Henricks
Sidewalks, &c. Bracing for J. Jacobs
Sign L. G. Wilhems
Sign board letters and the like, Manufacture of F. Ebert
Signal controlling mechanism V. I. Smart
Signal device R. Dawson
Skate E. H. Barney
Slag handling plant V. R. Browning
Sled runner E. C. Burgess
Sledge F. Brandner
Sleigh and boat, Combined A. Pfeifer
Sleigh running gear E. Perry
Sliver can J. F. & J. H. Braime
Smelting apparatus, Pyritic C. Antoonovich
Smelting, Electric P. L. T. Heronit
Smoke condenser P. McDermott
Snap fastener W. C. Stiles
Snaphook F. S. Bieber
Sole pressing machine 2 pats. B. F. Mayo
Sound to the ears, Means for conveying S. J. Port
Sparkling igniter J. M. Smith
Speed box and brake operating mechanism E. Henriksen
Speed mechanism, Variable 2 pats. H. R. Stacks
Splicing sleeve H. Frankel
Spring wheel A. P. Stewart, Jr
Soring wheel C. L. Anderson
Stable flooring A. E. Noppel
Stacker and rake, Combined hay J. H. Lunsford
Stamo mill mortar, One G. H. Niasse
Stamp, Time W. C. Jones et al
Staple forming machine W. N. Hunter
Steam boiler R. C. Stevens
Steam generator E. & H. R. Bretney
Steam generator, Water tube N. J. Suckling
Steel breaking means F. Hillix
Steel, Manufacturing H. Delport, Ellis
Steel of high grade from ordinary iron, Preparing A. Massott, Jr
Steering mechanism for ships A. W. Ottiznion
Sterilizing apparatus E. Kronman
Still F. I. Stokes
Stone cutting saw J. S. Young
Stove leg and means for attaching casters thereto H. Landis et al
Stoves and the like, Automatic controlling device for gas F. Bergendorf
Stovepipe J. McGhie et al
Structure and making the same, Artificial 2 pats. W. E. Hassam
Stud, Wire P. Dosch
Stump puller and capstan I. M. Hensley
Succrate of lime, Apparatus for making J. F. Pool
Supplemental wheel M. D. Stocking
Suspenders G. H. Detert
Sweeping comound B. Slinger
Switch interlocking mechanism F. C. Anderson
Switchboard construction T. A. & W. P. Hammond
Tank heater I. S. Jacobsen
Tank support H. E. Macomber
Target J. H. Finney
Teaching device, Penmanship L. G. McConachie

Telegraph and telephone switchboard W. H. Gabel
Telephone and telegraph lines, Device for locating defects in C. G. Buttler
Telephone apparatus C. S. Winston
Telephone attachment H. Gross
Telephone switchboard apparatus H. P. Clausen
Tent T. J. Blagg
Thermometer E. L. Baker
Thill coupling D. L. Tschantz
Threads, Die for cutting tapered W. Shaw
Thresher band cutter and feeder T. S. Pearson et al
Ticket case A. F. Armstrong
Tile making machine S. A. Jones
Tile press W. P. Meeker
Time recorder, Record control for H. B. Martin
Tire, Pneumatic T. J. Chatham et al
Tires, Adjustable friction belt for automobile E. Grifeder
Tobacco, Treating E. A. De Schweinitz
Toe weight J. D. Keller
Toilet case M. Rauschenbusch
Tool, Combination H. F. Loeschner et al
Tool, Combination W. Booth
Tool driver, Portable W. P. Kipper
Tool handle E. T. Brown
Tool handle and tool A. F. Ayers
Tool holder A. T. Merrill
Tool holder A. S. Remsburg
Tool, Pneumatic H. R. Prindle et al
Tower and tank R. B. Tufts
Towers, Leg fountain for skeleton R. L. Allen
Toy H. C. Moore
Toy F. M. Pittman
Toy, Aerial G. W. Norton
Trace clip C. A. Guntzmoen
Traction wheel J. R. Golden
Traction wheel, Walking J. W. Wooley
Train order check system W. R. Scott
Transparency 2 pats. P. E. Collins
Trestle, Adjustable J. G. Breckenridge
Triangle, Adjustable 2 pats. H. O. Field et al
Trolley pole attachment P. F. Duross
Trolley wheel E. H. Johnson
Trolley wire cleaning device, Overhead J. L. Snitker et al
Truck, Car O. S. Pulliam
Truck, Scoop J. W. McMann
Trucks, Oil box receptacle for car W. R. Symons
Truss, Hernial J. W. Bunker
Tubes, Apparatus for assembling and disassembling flexible J. Merritt
Tubes, Apparatus for the manufacture of metal B. F. McTear
Turbine, Elastic fluid P. G. Roesti
Turbine, Explosion gas A. Stodola
Turbine, Steam 2 pats. T. W. Smith
Turbine G. W. Beerbower
Type setting and type casting machines, Lifter attachment for E. C. Lampson
Type, Sorts machine for making 2 pats. T. H. Brown et al
Type writer M. C. Bledsoe et al
Type writer carriage mechanism C. I. Paulson
Type writing machine escapement mechanism E. B. Hess
Umbrella, Folding C. Lomb
Umbrella pivot joint S. S. Fritz et al
Valve, Flap E. Wiki
Valve for self playing instruments C. H. Johnson et al
Valve for vacuo pneumatic tube systems, Relief J. J. Stoetzel
Valve, Gate L. D. Castle
Valve locking device W. L. Case
Valve mechanism J. P. Mern
Valve mechanism for internal combustion engines L. M. Osborn et al
Valve motion for explosive engines F. J. Petermoller
Varnish for ordnance metal surfaces A. Herbig
Vault, Grave J. G. Landon
Vault light W. H. O'Brien
Vehicle M. L. Johnson
Vehicle fender, Motor B. P. Wise
Vehicle friction brake T. J. Lindsay
Vehicle seat, Adjustable A. C. Anderson
Vehicle seat brace M. Hoagland
Vehicle spring G. S. Beers
Vehicle third seat T. Bond, Sr
Vehicle wheel J. M. Lander Jr
Vehicle wheel M. G. Babio
Vehicle wheel J. F. De Varnette
Vehicle wind shield E. Schildback
Vehicles, Shock absorbing apparatus for F. Rimallho
Velocipede, Railway motor W. S. Hovey
Velocipede, &c. Speed indicator for J. B. Winter
Ventilator, Navigable R. MacDonald
Vessel, Navigable J. P. Pool
Vessel stopper A. A. Low
Veterinary mouth speculum F. E. Rutherford
Viscous, semisolid or like substances, Receptacle or container for F. R. James
Voice extension attachment, Combination J. N. Courtney
Wagon bracket J. Kamieski
Wagon jack C. Stillabower
Wagon, Spring G. B. Cusack
Wagon starter M. S. Cusack
Wagon wheel H. Holgate
Washing machine R. E. Redmond
Washing machine bottom N. Schmit
Washing machine operating mechanism W. C. Christy
Washstand R. C. Goblentz
Watch cleaning machine W. F. Knowles
Watch movement E. Huhacher et al
Watch movement box W. M. Black
Watch retractor O. Ohlson
Water bag and the like stopper I. Nuttall
Water heater H. C. Leydord
Water heater, Electrical F. J. Condon
Water heating apparatus F. F. Gates
Water purifying apparatus O. L. Stump et al
Water tube boiler O. Guilleme
Wave motor I. Luck
Weather flask I. S. Moscovitz
Weather strip I. A. Scroggins et al
Weaving, Dobby mechanism for leno J. B. Rolton
Weft, Mechanism for preventing the entangling of R. S. Meyers
Weighing device, Automatic B. P. Mulloy

Welding machine, Electric chain H. Robinson
Welding tapered tubes, Apparatus for J. M. Davidson
Well drilling machine R. L. Woodard
Wheel B. C. Seaton
Wheel W. B. Traber
Wheel J. P. Stuart
Wheel J. H. Harrington
Whiffletree attachment L. Decker
Whip buttons, Crimper and tucker for D. C. Hall
Whisk broom P. J. Chanavaz
Window fastener A. Martineau
Window frame, Metallic E. G. Brail
Wire clamp O. E. Lewis
Wire coupling P. W. Hutchens
Wire twisting and cutting tool H. W. Struss
Wire winding tool H. J. Hjord
Woven fabric J. K. Dalkranian
Wrapper cutting and transferring mechanism O. Hammerstein
Wrench G. C. Ferguson
Wrench J. O. Lalonde
Wrench H. Kilby
Writing a plurality of signatures or inscriptions, Means for simultaneously W. R. Woodward
Writing machine E. B. Hess

DESIGNS.

Bottle E. T. Booth
Chair seat, Wooden G. Beam
Coffee pot F. G. Holmes
Glass, Plate R. Fortempa
Penal tip, Lead L. Solinger
Pin or brooch A. E. Colbata
Plate M. J. Mullins
Teapot F. G. Holmes
Teapot or similar article L. Rougnat

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MECHANICAL PATENTS.

Adjustable chair S. Kline
Advertising device C. H. Smith
Advertising device W. S. Haynes
Advertising device W. M. Cortell
Advertising machine J. Jewell
Air and regulating pressure thereof, Apparatus for supplying E. A. Hall
Air and water cooling apparatus J. Little
Air brake controlling mechanism E. G. Shortt
Air brake cylinders, Packing expander for G. Christenson
Air cooling apparatus O. Sterka
Amusement apparatus F. M. Cory
Amusement device 2 pats. J. S. Winnick
Amusement device H. J. Westerman
Animal shears T. A. Martin
Animal trap M. J. Cannon
Annunciator system W. E. Ebert
Antislipping device W. E. Partridge
Arches, Adjustable and portable false work for J. E. Street
Atomizer H. A. Hill et al
Atomizer and mixer, Vibrative liquid J. W. Tygar
Audiometer J. M. McCallie
Auger, Earth L. H. Livermore
Automobile brake C. J. Roberts
Axle adjuster I. W. Shirk
Axle, Mine car C. A. Keller
Axle skid T. T. Bookman et al
Axle spindle W. P. Coker
Bag filling apparatus A. M. Bates
Bag holder W. M. Brath
Baking apparatus M. Brand
Balance wheel regulating device J. A. Frennd
Bandage, Facial A. L. Black
Bank, Savings 2 pats. W. Sams
Beam clamp and hanger D. A. Alexander
Bearing R. P. Thompson
Bearing A. E. Thomas
Bearing, Roller I. J. Jacob
Bed, Extension sofa I. I. Muller
Bed, Folding C. F. Philblat et al
Bell ringer C. C. Sowder et al
Bench stop M. R. Raynesford
Beverage dispensing apparatus J. C. Cory
Binder, Loose leaf W. J. Dunn
Blinder sails or fans, Operating mechanism for T. Latt
Binders, Rope forming attachment for L. Schroy
Bit holder and extender E. T. Murray
Blindstitching machine J. E. Fefel
Block P. J. MacDonald
Blocks or bricks, Making molded F. Zagelmeyer
Board cutter, Tongued G. W. Schilling
Bobbin and spindle connector 2 pats. J. Rowley et al
Bobbin notching machine J. A. Blood
Boiler furnace, Steam W. Graham
Boiler under pressure, Apparatus for testing the water of A. Schmitz
Bolster S. Otis
Bolt clipper H. K. Porter
Bolts and the like, Holding pin for toggle J. H. Cook
Boot calks, Forming H. K. Jones
Bottle capping machine R. Zastrow
Bottle closure 2 pats. F. W. H. Clay
Bottle locking attachment, Milk J. T. Rowley
Bottle, Non-refillable J. Spinella
Bottle, Non-refillable J. D. Harless
Bottle, Non-refillable W. K. Browne
Bottle, Non-refillable J. Burdick et al
Bottle, Non-refillable E. F. Branch
Bottle, Poison J. Banford
Bottles, jars and other receptacles, Closure for 2 pats. J. V. Hall
Box J. A. Douglas
Box cover, Service H. P. Martin
Box covering machine 2 pats. P. S. Smith
Box strapping reel E. B. Dunn
Braiding machine V. Beaugrand
Brake P. X. Beaulieu
Brake M. Levin
Brickmaking machine R. E. & G. F. Laughray
Brickmaking machine I. E. Hiscoc
Brooder W. F. Mikolasek
Broom trimming machine C. Plunkett
Brush, Fountain marking and stencil E. A. & C. A. Garvey
Brushes, Making A. T. Church
Bullet and shot, Self lubricating B. L. Williams

Burglar alarm..... B. See
 Burning lime or other substances..... J. Reaney, Jr
 Bust supporter..... J. Kellogg
 Butter cutting machine..... R. A. Simpson
 Butter shipping and storing box..... A. C. Hammer
 Buttonhole stitching machine..... C. A. Dahl
 Cabinet, Register..... P. G. Powers
 Cable terminal..... F. B. Cook
 Cable terminal and system of protection..... F. B. Cook
 Calculating device..... G. H. Benedict
 Calumeter..... A. Englerth
 Caliper machine..... E. C. Aszman
 Camera magazine..... O. H. Weichel
 Camera, Monocular..... C. G. Stevens
 Camera, Panoramic..... R. H. Trumbull
 Can heading machine..... W. H. H. Stevenson
 Can heading machine, Automatic..... J. J. Griffin
 Can holding clamp..... M. L. Marshall
 Can opener..... J. Codville
 Can washing machine, Milk..... A. B. Herr
 Cans, Sealed lock for milk..... E. Stoops
 Candy machine, Stick..... E. J. Jenner
 Cane stripping and cutting knife..... J. W. Thompson
 Canopy supporting frame..... G. A. Williams et al
 Capping and the like, Corrugated iron ridge..... W. H. Mence
 Car..... R. S. Mears et al
 Car brake..... H. W. Thomas
 Car controlling system, Electric..... C. P. Breese
 Car, Convertible..... W. W. Wallace
 Car coupling, reissne..... W. S. Schroeder
 Car fender..... J. T. Macgregor
 Car fender..... P. J. Leahy
 Car grain door, Box..... H. J. Forst
 Car operative mechanism, Damping..... C. A. Hallen
 Car propelling means..... R. G. Coyner
 Car seat and berth, Sleeping..... J. F. Butz
 Car spring support, Motor..... J. J. Vanden Bergh
 Car switching mechanism..... A. Hector
 Carboys, Packing receptacle for..... V. Verily
 Carburetor..... S. W. Peregrine
 Carburetor..... F. H. Messinger
 Carburetor..... J. Stubbers
 Card clothing, Means for tacking on..... A. Arnold
 Carpenter's combination tool..... J. M. Darrow
 Carpet cleaning device, Pneumatic..... C. S. Baldwin
 Carpet fastener..... P. J. A. Smith
 Carrier..... V. Filtean
 Casting apparatus..... I. R. Williams
 Cattle guard..... R. Morrill
 Cement package..... A. Thomas
 Chain link..... W. H. Griffith
 Check protector..... F. B. Pease et al
 Cheese cutter..... C. M. Wright
 Churn..... G. W. Robertson
 Chute support for vehicles, Coal..... A. C. Elphinstone
 Cigar holder..... W. H. Alexander
 Cigar tip cutter..... E. Brunnhoff et al
 Circuit breaker, High potential..... L. G. Robinson
 Cleaning device, Pneumatic..... L. O. Howell
 Clock..... A. C. Ohl
 Clothes line support, Adjustable..... A. Z. Boudreaux
 Clothes pin..... J. P. Marshall
 Coal cutting machine..... 2 pats. J. Lippis
 Coal drill..... J. S. Snrbaugh
 Cock for steam boilers, Blow off..... J. B. Duffy
 Cock, Gage..... G. Pennell
 Cock, Three way..... E. A. Hall
 Coin collector..... H. B. Holmes et al
 Coin controlled apparatus..... M. F. Price
 Coin controlled mechanism..... J. E. Packard
 Collar tipping machine..... C. A. Royce
 Color comparator..... F. V. Kallab
 Compress..... R. D. Webb
 Compressors, Relief mechanism for..... E. Hill et al
 Concrete block machine, Knockdown adjustable..... J. E. Street
 Concrete blocks and slabs, Manufacturing..... O. Bradford
 Concrete mixing machine..... L. C. Roberts et al
 Condenser, Surface..... W. Schwanhauser
 Conduits and the like, Junction piece for branches of air..... C. H. Mower
 Conveying apparatus..... T. S. Miller
 Cooking utensil..... J. Buckley
 Corrugated bar..... A. L. Johnson
 Corrugating machine..... E. R. Stasch
 Cotton gin brush..... W. W. Robinson
 Cotton picking machine..... J. F. App'by
 Cover and holder for drinking vessels, Combined..... L. Brugel
 Crate..... J. P. Richards
 Crate, Banana..... I. Albertelli
 Crate, Collapsible..... H. C. Ivey
 Cream separator, Centrifugal..... D. R. Green
 Crutch..... M. J. Dunkel
 Cultivator, Two row..... S. E. Bailor et al
 Converter..... M. J. Stoffer
 Current motor..... C. E. Hultgreen et al
 Cushion..... E. G. Budd
 Cutter head..... J. W. Wingham
 Cycas leaf holder..... W. N. Reed
 Cycle supporting attachment..... H. Stiles
 Cycles, Grip controlling mechanism for motor..... L. P. Fosnot
 Cycles, Grip operated controlling mechanism for motor..... C. J. Gustafson
 Dampener..... A. Shapiro
 Dams, Automatic movable crest for..... G. F. Stickney
 Decorticating machine..... G. H. Reynolds
 Dental pliers..... L. E. Rowley
 Dental separator..... R. L. Anderson
 Dentist's cabinet..... W. H. Woods
 Deodorizing apparatus..... J. E. Ralston
 Design producing apparatus..... S. Boehm
 Desk and seat, Combined..... J. T. Brent, Second
 Detuning..... C. E. Acker
 Die..... S. W. McKillop
 Dish washing machine..... J. E. Conway
 Dish washing machine..... E. J. Robinson
 Disinfecting apparatus..... W. J. Bowerman
 Display cover for provision and other receptacles..... J. La Rocque
 Display shelf and rack, Combined..... T. L. Newport
 Distilling apparatus..... W. F. M. Goss

Door attachment..... E. W. Simmons
 Door hanger, Rolling..... M. E. Hunt
 Drafting instrument..... P. C. Hanbold
 Drafting instrument..... 2 pats. F. G. Hall
 Draining and irrigating apparatus..... I. M. Newman
 Draw bar mechanism..... G. H. Forsyth
 Drawers, cash boxes and the like, Secret locking device for..... I. Kraft
 Drill machine gear..... J. F. Back
 Drilling machine..... J. S. Barnes
 Drying apparatus, Automatic temperature regulator for revolvable..... H. F. Westphal
 Dust collecting machine..... F. W. Agan
 Dust suction apparatus, Filter for A. Mesiliz
 Dynamo and governor, Sparking..... A. P. Griebel
 Dynamos, Field regulator for..... G. S. Neeley
 Egg case, Folding..... R. E. L. Crosby
 Egg tester..... W. F. Mikolasek
 Electric cable coupling, Lead covered..... J. J. Dosert
 Electric controlling device..... M. Kallmann
 Electric controlling system..... C. P. Breese
 Electric light cluster..... L. Brucka
 Electric machinery, Dynamo..... W. L. Waters
 Electric machines, Voltage regulator for dynamo..... 2 pats. G. S. Neeley
 Electric motor control system..... H. D. James
 Electric motor controlling means..... W. A. Paris
 Electric motor suspension means..... C. A. Psilander
 Electric time switch..... M. Neumann et al
 Electric wiring, Rosette for..... W. F. Ritter
 Electrical apparatus..... W. H. Thompson
 Electrical rosette..... J. S. Stewart
 Electrically heated shaft furnace..... J. S. Edstrom
 Electrodes, Making seamless tubular pockets or receptacles for storage battery..... T. A. Edison
 Electrolytic cell..... E. A. Allen
 Electrotherapeutic apparatus..... L. G. Woolley
 Elevating means..... H. Baden et al
 Emergency wheel..... G. H. Treadgold
 Enameling, Method of..... C. R. Schmidt
 Engine controlling apparatus..... C. R. Welch
 Engine speed regulating device, Explosive..... L. W. Wittry
 Engine system, Gas..... J. L. Tate
 Engines, Air cooling system for explosive..... R. Herman
 Engines, Mixing device for combustion..... H. Bonte
 Engraving or sinking dies, Machine for..... J. F. Keller et al
 Envelop..... H. C. Murphy
 Estimating machine..... E. P. Holmberg
 Explosive engines..... F. W. Bacon
 Explosive engine..... G. Cornilleau
 Eye guard, Collapsible..... H. M. Tileston
 Eyeglass attachment for caps and hats..... J. A. Blackiston
 Eyeglass nose piece..... G. Bausch
 Eyeglasses..... L. F. Adt
 Eyeglasses..... G. A. Bader
 Eyeglasses, Lens mounting for..... G. Bausch
 Eyeglasses, Reversible..... W. T. Allan
 Fabric and garment..... A. J. Cummock
 Feed and litter carrier..... H. L. Ferris
 Feeding apparatus for boilers..... E. Nashold
 Fence..... J. L. Mackey
 Fence post, Composite..... J. Stoneburner
 Fence post, Composite..... E. T. Silvius
 Fence weaving machine, Wire..... L. W. Showalter
 Fence wire clamp..... S. F. Webb
 Fertilizer distributor..... E. N. Camp
 Fibrous material, Saturating..... J. A. Dubbs
 Fibrous or elastic material, Sheet of..... C. Wissenbach
 Film pack..... G. L. Holmes
 Filter press..... L. S. Schoenfeld
 Filter, Water..... L. C. Hartstough
 Filtering can..... U. G. Thompson
 Fire alarm..... W. J. Randolph
 Fire extinguisher, Chemical..... A. F. Sargeant
 Fire hydrant..... C. C. Steiner
 Fire shield and extinguisher..... S. German
 Firearm sight..... G. B. Crondall
 Firearms, Firing pin lock for..... F. F. Burton
 Fireproof column..... J. J. Tresidder
 Fish hook bait holder..... C. Fredricks
 Fishing float..... W. N. Simmons
 Flat iron heater..... J. Andersen
 Floor polishing machine..... A. A. Miller
 Fly paper..... E. V. R. Gardiner
 Folding table..... J. A. Keck
 Foot press..... J. Costello
 Fork and hook, Combined..... H. M. Schlusser
 Form, Bust..... L. A. Bachman
 Fruit picker..... R. R. Woodring
 Fuel preparing and feeding apparatus, Fine..... A. A. Day
 Furnace..... G. & T. Wilton
 Furnace for the treatment of refractory ores..... W. P. Wynne et al
 Furnace grate..... G. A. Kobout
 Furnace grate, Rocking bar..... F. W. Ridlon
 Furnaces, Automatic continuous ore smelting process for reverberatory..... G. G. Vivian
 Garbage receptacle..... H. E. Ames
 Garment..... R. E. Lowe
 Garment adjusting device..... J. Mathers
 Garment hanger..... C. W. Brenizer
 Garment hanger..... A. M. Taylor
 Garment hook..... D. Apstein
 Gas and treating distillation gases to produce the same, Illuminating liquefied..... H. Blau
 Gas burner..... R. Thompson
 Gas burner..... V. W. Blanchard
 Gas burner, Incandescent..... J. I. Robin
 Gas burner tip, Acetylene..... E. J. Dolan et al
 Gas compressor..... R. O. Klatte
 Gas economizer..... H. E. Davis
 Gas engine..... F. R. White
 Gas engine..... C. I. Longenecker
 Gas generator, Acetylene..... F. C. Wilson
 Gas heater or stove..... W. Howell
 Gasoline engine..... O. S. Benckendorf
 Gate..... D. James
 Gate..... F. P. Gutelius
 Gear, Speed..... F. H. de Veuille
 Generator..... W. M. Jewell
 Glass blowing machine..... 2 pats. R. P. Frist
 Glass molding machine..... R. P. Frist
 Glass plates, Machine for grinding edges on..... H. Lohmann
 Glass pot handling apparatus..... H. Aiken
 Glass sheets, Manufacture of..... W. T. Nichols
 Glove or mitt, Catcher's..... J. M. Rumrill

Glove presser and holder..... D. F. Greenawalt
 Grain separator..... J. S. Evan
 Grinder, Disk..... R. V. Fields
 Grinding and polishing machine, Sheet metal..... J. E. Lewis
 Gun, Automatic..... M. L. Bristol
 Gun carriage..... S. N. McClean
 Gutter sweeping machine..... J. Welland
 Hair pins, Manufacturing..... D. H. Haywood
 Hame fastener..... S. T. Marlette
 Hand wheel..... A. M. Gow
 Harness loop..... M. E. Zeller
 Harrow..... T. B. Doty
 Harrow cart..... J. Kirkpatrick
 Hay gatherer and dropper..... C. S. Johnston
 Hay gatherer and press, Combined..... D. Nofzinger
 Header and cutter, Corn and maize..... A. F. Hendricks
 Heater..... I. H. Black
 Heating apparatus, Hot water..... H. V. Jorgensen
 Heating can..... P. Friedman et al
 Heating furnace..... N. W. Dimpsey
 Heating system..... J. Hedlund et al
 Hinge..... G. C. Gardner
 Hinge and fastener, Blind..... W. Dupre
 Hoisting apparatus..... C. H. Sample
 Hook and eye..... J. W. Granger
 Hook and eye card holder..... C. B. Patterson
 Hook fastener, Garment..... G. E. Figg
 Hook retaining rack, Meat..... W. R. Perrin
 Hook switch..... E. B. Craft
 Horn support..... E. C. Goldsmith
 Horse operated mechanism..... C. E. Wadsworth
 Horse rake..... H. L. & E. C. Litchfield et al
 Horseshoe..... A. Kerry
 Horseshoe's stand..... C. F. Southworth
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 Hose coupling..... A. R. Robbins
 Hose coupling..... K. O. Muehlberg
 Hoseless, Seamless..... J. W. Mettler
 Hot water heater..... G. G. Schroeder
 Humidifier..... F. B. Comins
 Hydraulic drill and reamer..... H. Bennerseidit
 Hydrocarbon burner..... T. F. Kent
 Identification device for business transactions..... A. F. Hopkins
 Implement..... T. M. Walker
 Implement pocket or desk..... O. Munsian
 Incubator..... W. F. Seyfer
 Induction coil unit..... C. A. Pfanstiehl
 Ingot extractor, Electric..... H. Aiken
 Injection apparatus, Rectal..... C. E. Quimby
 Inkstand..... E. T. Darke
 Inkstand..... L. C. Ferrell
 Inkstand, Automatic..... N. W. Brown
 Insect trap..... J. A. Dietz
 Insects, &c., Device for preserving..... E. S. Munroe
 Insects from plants, Machine for removing..... P. E. Larson
 Insulator..... C. S. Smith
 Insulator..... A. A. Pratt
 Insulator support..... W. Steiner
 Iron ores, Agglomerating pulverulent..... W. Schumacher
 Ironing raw starched material..... L. Hoffmann
 Jack..... D. A. & C. W. Blake
 Jack..... E. J. Carberry
 Jeweler's tray..... D. Goldsmith
 Key ring..... T. F. Pryor Jr
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 Lamp, Denatured alcohol gas student..... G. G. Schroeder
 Lamp fonts, Adjustable handle for..... G. H. Rolles
 Lamp holder..... J. W. Kerr et al
 Lamp shades, Molding for..... L. H. Debs
 Lamps or gas burners, Mantle and holder for inverted..... N. Fuchs
 Latch bolt..... P. J. Courteray
 Lathe..... H. Bertram
 Lathing, Machine for pressing woven..... H. W. Carpenter
 Lazy tongs elevator..... A. Jefferis
 Lever..... W. A. Gillettine
 Lifting device..... J. H. Rottgen
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 Locker..... A. J. Thornley
 Loom..... R. H. Sawyer
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 Loom head motion..... J. J. Shaunahan
 Loom reed support for warp drawing machine..... E. F. Hathaway
 Lubricator..... C. Comstock
 Magnetic transmission mechanism..... F. Jensen
 Mail bag rack..... M. S. Field
 Mail chute closure..... J. W. Cutler
 Manufacturing device..... C. L. Converse
 Manure spreaders, Pusher for..... D. K. Wilson
 Marrow, Process of and product from treating..... E. Klein
 Measuring tape holder..... R. E. Nelson
 Medical instrument..... J. S. Collins
 Medicated bangle..... L. Sensburg
 Medicine case..... R. L. Taylor
 Merry-go-round, Aquatic..... H. Healy
 Metal cleaning and protecting material, Manufacture of a..... W. Braun
 Micrometer gage..... C. R. Shaffer
 Mirror, Portable folding..... J. C. May
 Miter joint fastener..... J. V. Ashcraft
 Monkey wrench..... S. V. Rehart
 Mop wringer..... A. J. Smith et al
 Mopping machine..... J. W. O'Connor
 Motion, Clutch for transmitting rotary..... W. Murphy
 Motor regulator..... G. H. Wittingham
 Music playing instrument, Antipneumatic..... F. C. White
 Music sheet mechanism..... T. P. Brown
 Musical instruments, Automatic playing attachment for 2 pats..... T. P. Brown
 Musical instruments, Mouthpiece for wind..... E. Harrison
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 Nut, Lock..... F. P. Vaughan
 Nut lock..... W. W. Christy
 Nut lock..... C. Davis
 Nut tapping machine..... J. M. Ralston
 Oil cake stripping machine..... A. W. French
 Oil preparations, Insipid sandalwood..... H. Vieth
 Oiler..... W. L. Miggitt
 Ortho-dioxyphenylethanolamin..... F. Stolz et al
 Ortho-dioxyphenylethanolamin, Making..... F. Stolz et al

Oven, Baker's..... W. J. Stoefler
 Oven or cooking apparatus, Steaming..... J. P. Bruck
 Packing..... L. H. Martell
 Packing case..... W. D. Ballou
 Packing machine..... C. F. Bissinger
 Packing, Metallic..... R. J. Harper
 Padlock..... M. Ackerman
 Pail support, Milk..... W. C. Webb
 Paint..... G. W. Allen
 Paint tool, Pneumatic..... E. F. Hubert
 Pan lifter..... C. F. Skoog
 Paper box machine..... I. W. Hollett
 Paper box machine..... A. W. Mitchell
 Paper weight and pen rack, Combined..... J. W. Bierlein et al
 Paving material and manufacture thereof..... J. A. Dubbs
 Perambulator..... D. R. Collier
 Percussive drill..... H. P. Taylor
 Photograph printing machine..... J. C. Calhoun
 Photographic multiplex copying machine..... O. Prange
 Photographic printing apparatus..... A. H. Mallison
 Picture exhibiting machine..... A. S. Howell
 Picture exhibitor..... A. M. Becker
 Pinch dog..... E. O. Olsen
 Pineapple cutting machine..... E. K. Ellsworth et al
 Pipe closure..... A. A. Flak
 Pipe cutting and threading tool..... G. W. Nye
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 Pipe mold..... E. L. Adams
 Pipe mold, Expanding..... C. S. Burton
 Pipe, Round seam expander for making sheet metal water..... C. H. Bogart
 Piston and piston ring..... C. A. Smith
 Plastering, Fibrous..... E. Combs
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 Pneumatic despatch tube apparatus..... I. W. Litchfield
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 Pocket Watch..... A. Ehrenreut
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 Power controlling mechanism..... W. R. McKee Jr
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 Power shovel..... J. Klesler
 Power system..... G. Ayres
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 Printing machine, Box..... J. C. Leary
 Printing press..... C. G. Harris
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 Printing press feeding and delivery mechanism..... A. F. Harris
 Printing presses, Jogger for platen..... W. W. Britan
 Printing presses, Producing printing surfaces for use in..... S. Carleton
 Pump..... E. J. Feeny
 Pump cylinder for water lifts..... L. C. Lewis
 Pump, exhauster and blower, &c., Rotary..... F. Lamplough
 Pump, Fluid packed..... E. J. Feeny
 Pumping apparatus, Pneumatic..... L. W. Eggleston
 Punch, Multiple..... F. C. M. & E. F. Silvers
 Putlog support..... W. E. Mohan
 Puzzle box..... R. H. Howard
 Quilting apparatus..... W. H. Bouwell
 Rack..... C. W. Donley
 Rail chair and joint, Combined..... H. L. Topplin
 Rail joint..... J. B. Baum
 Rail joint, Interfittling..... D. F. Kelly
 Rails to railway ties, Means for securing..... E. Hamilton
 Railway crossing..... J. W. Helms
 Railway drawbridges, Rail lock for..... W. L. & F. P. Smith
 Railway frog..... J. E. Lewis
 Railway, Pleasure..... 2 pats. A. Bragg
 Railway switch..... T. J. Burke
 Railway terminal for cambered bridges..... J. T. Hambay
 Railway tie..... J. MacMartin
 Railway tie, Composite..... R. M. Chapman
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 Railway track gage, tie adjuster, holder and curve elevator..... C. Warren
 Range finder..... A. Swasey
 Razor..... J. F. Bailey
 Razor, Safety..... W. S. Hopkins
 Razor stop..... A. W. Slevin
 Reeds, Machine for making false..... W. E. Wingate
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 Ribbon slide..... D. J. Strassel
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 Roller, harrow and drag, Combined..... D. W. Davis
 Root cutter..... F. J. Horrigau
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 Rotary machine..... A. Honfg
 Sad iron holder..... C. W. Dollinger
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 Safe door supporting and locking mechanism..... W. Corry
 Safe or vault..... M. Moser
 Sand bailer..... U. Mong
 Santalol carbonate..... H. Vieth
 Sash holder, Antirattling..... T. J. Benedict
 Screen..... F. M. Kepler
 Screw driver..... M. Garratt
 Seal, Bottle..... L. E. Hendrickson
 Seal, Shackle..... L. S. Flatau
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 Sewing machine..... J. G. Lewis
 Sewing machine attachment..... D. F. Harris
 Sewing machine, Blindstitch..... J. E. Fefel
 Sewing machine fan attachment..... W. W. Morris
 Sewing machine feeding mechanism, Button-hole..... E. B. Allen
 Sewing machine lap seam feller..... A. H. De Voe

Sewing machine motor attachment J. Y. Parce
Sewing machine shuttle..... J. E. Fefel
Shade roller bracket..... A. H. Fleming
Sheet metal by electrolysis. Treating..... J. Muller
Sheet metal characters. Manufacturing..... G. G. Garrison
Sheets, cards, envelopes, &c. Separating and feeding device for..... R. E. & A. Kemper
Shelving construction..... R. R. Belcher
Ship..... J. Reid
Shipping and display box or receptacle. Folding..... G. L. Born et al
Shoe..... S. A. Emanuel
Shoe dipping machine..... J. H. Wall
Shoe shank making machine..... A. D. Garney et al
Show case or box..... C. Fessler
Sieve..... G. E. Netherth
Sign. Flash..... J. S. Nesbitt
Signaling system. Electric..... A. L. Sohm
Signaling device. Automatic electric..... A. J. Roy
Slik degumming machine C. Ferenbach et al
Skate. Roller..... A. Armband
Skate. Roller..... F. L. Rumble
Skirt gage..... M. L. Pratt-Chadwick
Sled brake..... J. F. Irons
Sled brake..... W. H. Stevenson
Sleeve and skirt board. Combined..... B. M. Hallareu
Slicing machine. Fruit..... C. M. Heffron
Smelting and refining copper ores and compounds..... R. Bagga'y
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Smoke consumer..... A. R. Markel et al
Soap dish..... J. J. Butcher
Soldering device..... H. White
Speed and brake controller..... G. A. Bell
Spinning mule..... 2 pats..... W. D. Rundlett
Spring bracket..... J. B. Davies
Spring wheel..... R. O. Newport
Square. Calliper..... L. S. Starrett
Square. Carpenter's..... E. O. Iversen
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Squares. Attachment for carpenter's..... S. A. Burgett
Stalk cutter..... G. E. Harper
Stamp..... A. Heller
Steam trap..... 2 pats..... W. R. Templeton
Stencil duplicating apparatus..... A. B. Dick
Sterilizing apparatus..... F. A. Emerick
Stove door..... B. A. Saxier
Stove jacket..... G. M. Lord
Stove. Portable self cooking camp..... L. G. Fagersten
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Straight edge. Sectional..... H. W. Abbott
Strainer. Sink..... F. MacDonald
Strap, band and the like..... M. M. Lahue
Stump puller..... C. Olsen
Sulfocauld. Manufacture of..... J. Tcherulac
Sulky..... H. J. Miller
Sunken structures. Constructing J. W. Schaub
Surgeon's needle holder..... C. Driest
Surgical foot rest..... J. H. O'Reilly
Suspenders..... H. S. Heinemann
Swing..... F. W. Wallace
Swing. Lawn..... A. E. Potter
Switches and the like. Adjustable box for..... M. D. Barou
Switching device. Centrifugal..... C. B. Auel
Table cloths. Manufacture of printed M. Seitz
Talking machine record..... T. H. Macdonald
Telegraph. Printing..... C. L. Krum
Telegraphic transmitter for the Morse system..... T. C. Van de Stadt
Telephone attachment..... T. Endean
Telephone exchange system..... M. S. Conner
Telephone receivers. Holder for..... W. J. Mogridge
Telephone system..... W. W. Dean
Telescope..... A. Swasey
Thermometer sterilizer and holder..... G. M. Brubaker
Thermostat..... H. H. Pilcher
Thermostat..... S. B. Post
Thread dressing machine G. A. Fredenburgh
Ticket holder..... C. Lovenberg
Ticket. Pin..... A. G. Thompson
Tiles. Manufacturing..... J. R. Miller et al
Tie. Automobile..... A. Dameron
Tire cleasher and rim..... G. Lanoir
Tire setting machine. Cold..... I. M. Hackney
Tire. Vehicle..... W. E. Andrew
Tobacco. Removing nicotine from L. Parant
Tongs. Chain pipe..... W. R. Ritchie et al
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Toy. Mechanical..... T. V. Field
Toy snake..... S. Sillman
Tracker board. Sectional..... H. M. Smith
Traction engine..... P. Swenson
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Transformer. Electric..... I. Anderson
Tree protector..... J. H. Blerbaum
Trestle. Knockdown..... J. Fletsam
Trolley..... A. Hill
Trolley retracting mechanism. Automatic..... H. B. Clarke
Trolley switch frog and pole..... A. Neubert
Trolley wheel..... P. M. Orlopp
Trolley wheel..... H. B. Sawyer
Trolley wheel..... J. R. Kidney
Trolley wheel..... W. H. Bradt
Trolleys and harps. Spring for R. E. Noble
Truck. Baggage..... J. K. Kendrick
Truck for handling rolls of wire fencing..... W. H. Mason
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Truss..... E. H. Parker
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Tube bending apparatus. Metal W. Kennedy
Tube machine..... J. R. Harbeck
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Tunnel head..... A. B. Bittner
Tunnel. Submarine..... H. O. Smith
Turbine and regulating means therefor..... P. Nikonow
Turpentine from wood. Obtaining..... J. W. Thompson et al
Type bar and typographic form..... F. H. Richards
Type casting and composing machine..... W. E. Brand
Type writer..... R. W. Walker
Type writer carriage shifting mechanism..... W. E. Ingram
Type writer tabulator..... F. G. Kell
Type writers. Combined base pad and copy holder for..... C. C. Chrisman

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Underreamer..... E. Double
Vacuum creating method..... P. C. Hewitt
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Valve..... B. V. Constantinov
Valve. Angle blow off..... H. Kieren
Valve apparatus..... J. H. Gardiner
Valve. Blow off..... H. Kieren
Valve for air brakes. Pressure retaining..... C. L. Udegraff
Valve for air brakes. Triple..... W. B. Mann
Valve for steam engines. Reversing..... W. A. Flowers
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Vehicle brake mechanism. Hand propelled..... M. Murray
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Vehicle spring..... H. A. Grafe
Vehicles. Equalizing suspension device for..... R. G. Handy
Vehicles. Perch for road..... H. Higgin
Vender. Peanut..... J. C. Simerling
Vending machine. Coin controlled..... E. F. Spaulding
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Wagon..... H. L. Ferris
Wagon..... J. H. Housworth
Wagon. Dumping..... J. H. Murray
Wagon running gear..... T. O. Watkins
Wagon. Treadle operated delivery E. M. Gover
Waist fastening..... H. M. Love
Washbowl drainer..... M. L. Mace
Washing and rinsing machine for fibrous materials..... F. Bernhardt
Watch service recorder..... H. B. Holmes
Water closet apparatus..... R. E. Crane et al
Water feeding apparatus..... C. Jones
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Water heater and purifier..... G. R. Decker
Water meter..... W. S. Pollard
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Window..... E. W. Humphreys
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Window screen. Metal frame A. A. Day
Wire fabrics. Machine for the manufacture of G. H. Smith
Wire holder..... S. J. Brand
Wire or other material. Machine for feeding and cutting..... W. W. McCallip
Wood. Preserving..... S. W. Labrot
Wrench..... C. S. Hemenway
Wrench..... W. Gaffrey
Wrench..... W. F. Dinsmore
Wrench..... P. W. Osborn
Yarn. Device for forming balls from..... H. C. Clippinger
Yoke center. Neck..... E. C. Stillwell

DESIGNS.

Advertising device..... H. F. C. Soellner
Clock stand or similar article C. G. Canivet, Jr
Coin tray..... J. S. Barron
Emblem or badge..... C. H. Faas
Fabric. Textile..... J. S. Yergason
Lamp. Inverted gas..... J. Lederer
Reflector. Artificial light..... 2 pats..... K. Booth
Spoon or fork..... A. E. Colburn
Spoons or similar articles. Handle for..... C. A. Edmonston
Toy..... B. Goldenberg
Vase..... P. J. Bornstein

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Adhesive applying mechanism A. A. Shedlock
Adhesive supplying mechanism O. Tyberg
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Air brakes. Quick action automatic release mechanism for release L. Krimmelbein
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Bobbin molding apparatus. Fiber..... W. H. Thompson
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Bottle filling machine..... W. J. Cunningham
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Brake beam..... 2 pats..... N. H. Davis
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Braking construction..... E. B. McKenna
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Brick cleaning machine. Old..... A. LeBlanc
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Building block..... J. H. Denmead
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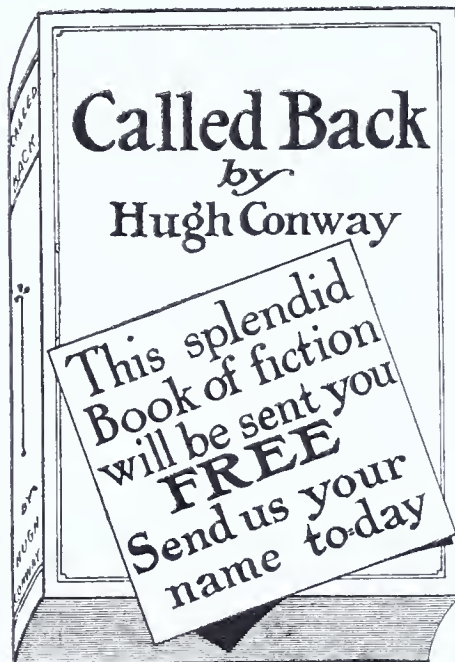
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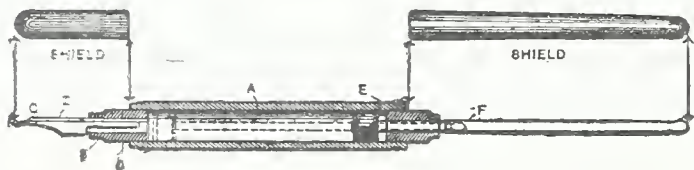
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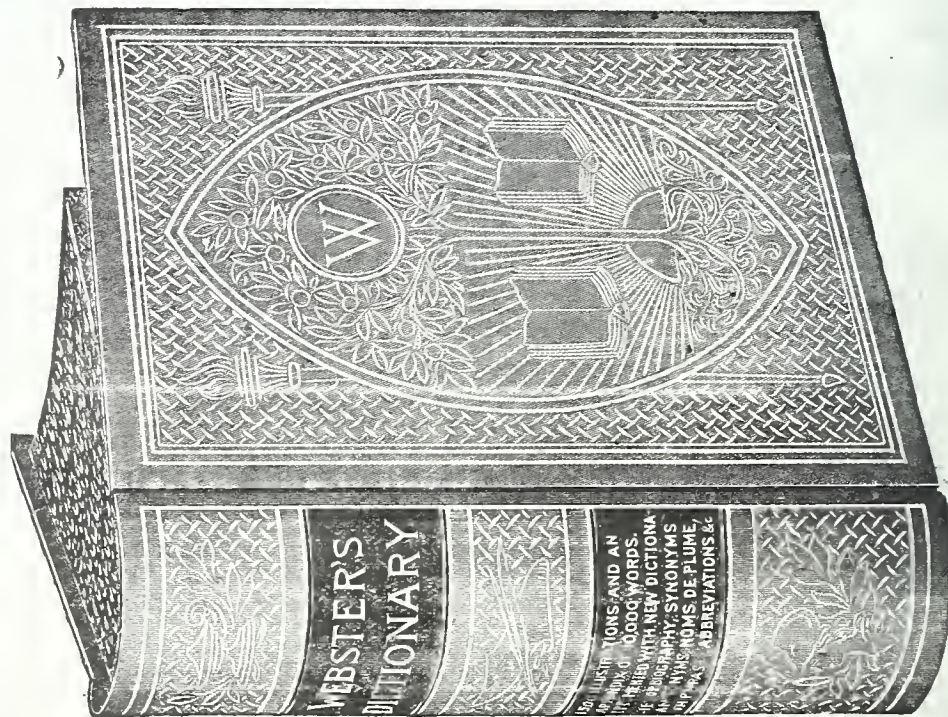
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ELECTRIC POWER AT NIAGARA.

THE transformation of water power was among the most interesting of the industrial developments that marked the close of the last century. The possibility of harnessing streams to machinery that would transform it into electric energy was first appreciated in southern Europe, and the French gave the name of "white coal" to this new form of power. When the movement spread to the United States, the attention of engineers was at once drawn to Niagara.

plants upon the Canadian side of the river, however, are of more recent construction, and differ so widely from the pioneers that a brief account of a few of the peculiar features are given below.

Standing upon the upper steel arch bridge and facing the Horseshoe Falls, one may observe at the foot of the cliff, forming the right hand wall of the gorge, a long but unobtrusive building, partly obscured by spray from the



BIRD'S EYE VIEW OF NIAGARA FALLS SHOWING POWER DEVELOPMENTS ON THE CANADIAN SIDE.

The great cataract offered unparalleled opportunities for supplying power at a very cheap rate, and plants sprang up around it to transmit electric power to cities near and far, and to manufacture aluminum, carborundum, and other electro-chemical products. The growth of these industries attracted widespread interest, and since the first installation upon the American side, descriptions of its work and methods have appeared in technical papers. The

cataract. This is the generating station of the Ontario Power Company. To the right, upon the bluff, is the distributing station, from which the power generated below is controlled and transmitted. Away to the left, hidden by the trees of Goat Island, are the buildings of the intake and head gates, through which the water from the river is diverted for use below.

From these head gates three great steel and concrete tunnels convey 12 000

cubic feet of water per second to the top of the cliff above the power house. Thence it passes through twenty-two steel penstocks in shafts and tunnels down and out through the cliff to horizontal turbines in the power house below. From the generators the electrical cables turn back through tunnels to the twenty-two banks of switches, transformers and instruments of the distributing station above and to the transmission lines beyond, completing an equipment for more than 200,000 horse power.

The intake was designed with special reference to the ice difficulties which have been a limiting factor in the success of power at Niagara. Cake ice in huge quantities floats down for weeks at a time from the Great Lakes, and mush ice is formed in the turbulent rapids by the freezing of spray and foam. To avoid this, a long forebay, protected at its entrance by the main intake, terminates at its narrow, down-stream end in a deep spillway. Upon the river side it is enclosed by a submerged wall, while the other side adjacent to the spillway is occupied by the main screen structure leading to the inner bay and to the portals and head-gates of the three conduits.

The intake, nearly 600 feet long, stretches across the bay at Dufferin Island almost parallel with the current in the river. Throughout its length a concrete curtain wall extends down 9 feet into the water, so that the gate openings beneath admit only deep water, and this at right angles to the swift exterior surface flow which carries the floating ice to the rapids beyond. At the main screen this operation is repeated. At the gate structure, the tapering portals are protected with wide mesh screens which are also safeguarded by a curtain carried by the front wall of the gate house. The screen frames are removable by an electric crane for cleaning and changing.

The main conduits are of reinforced steel imbedded in concrete 18 and 20 feet in diameter, 6,500 feet long, and are buried within the soil of the public park. The water flows through them at a velocity of 15 feet per second. Beneath the top of the cliff, 9 feet diameter branches pass from the under side of the conduit through gate valves, and become the penstocks. The spillway at the end of the conduit has an adjustable weir and a helical discharge tunnel which, after a steep initial pitch in the taper from the weir, follows a uniform grade and symmetrical curve while circling about to reach the river, thus preserving a smooth water column of highest velocity and least expenditure of energy. The generators are of conventional horizontal-shaft type, three-phase, 25 cycle, and deliver 12,000 volts per minute. The turbines are of inward flow type, double, central discharge or balanced twin turbines, designed to deliver 12,000 horse power under 175 foot head.

Three inclined cable tunnels lead from the generating station up through the cliff to the distributing station. The main cables follow the most direct routes from generators to trans-

formers. They do not converge for the accommodation of switchboards at any center where congestion may prevent separation or adequate insulation, but are laid quite regardless of switchboards. Unit values, corresponding to the generators in capacity and position, are maintained throughout. Thus each generating unit has its individual cables, switches and switchboard, section of bus-bars, transformers, interrupters and high-pressure switches complete to the transmission, enabling independent operation as an isolated power plant or, through the selector switches and, duplicate sectional bus bars, the operation of all units in any combination as perfectly as their operation in parallel. The arrangement of the apparatus is in parallel courses; like devices are arranged in rows parallel with the long axis of the generating and distributing stations, which are themselves parallel. A unit length of distributing station of similar relative position is devoted to the circuit and apparatus corresponding to each generator. Such symmetry is of marked value in an emergency, especially in a plant of many units, and becomes vital when the units are of such dimensions.

The distributing station is divided into three longitudinal bays; the front one contains the switches, bus-bars, etc., at generator pressure; the rear one contains those at transmission pressure. Between the two the middle bay is divided into two transformer rooms. Responsibility is classified and centralized under the care of a minimum number of chief operators, and distant electrical measurement and control are employed to an unusual extent. All the apparatus has been isolated by incombustible walls or barriers against the spread of oil or arcs, for protection from fire and from each other.

The type of intake, the symmetry of arrangement, centralization of control and isolation of apparatus, represent advances in power-plant design. The unusual volumes of water and of power involved presented new problems, necessitating the creation of new types. It is claimed that upon no similar work in this country, since that of the Niagara Falls Power Company years ago in the infancy of electrical power, has devolved such a burden of investigation, invention and original design.

Eels as Motors.

It has long been known that electric eels were capable of producing considerable amounts of electricity, and it occurred to some scientists in the tropics to measure this force. Copper wire collars were put about the necks of one hundred eels, they were placed in the zinc bath and connections were made between all the collars and a motor. It was found that they generated enough power to run a motor car 24 hours. The power from one eel was sufficient to produce a 45 candle incandescent light. In the same proportion it is estimated that 200,000 eels (which could be placed in a tank measuring not more than 12 feet each way) would produce 40,000 horse power. This would run the biggest ocean steamer now afloat.

ELECTRIC HEATING DEVICE OF FRENCH DESIGN.

By FRANK C. PERKINS.

Some unique and interesting forms of electric heating devices of French design are shown in the accompanying illustrations.

These French thermophile fabrics are constructed at Valdoie near Belfort, France, by Monsieur C. Herrgott, and are employed for carpet coverings and coverlets, and are utilized for industrial, as well as medical purposes.

It is well known that electricity, the transmitting agent of power and light, is also an excellent conductor of heat. By causing a certain density of current to pass through a conductor of determined resistance, the energy contained in the electric current can be almost completely transformed into heat.

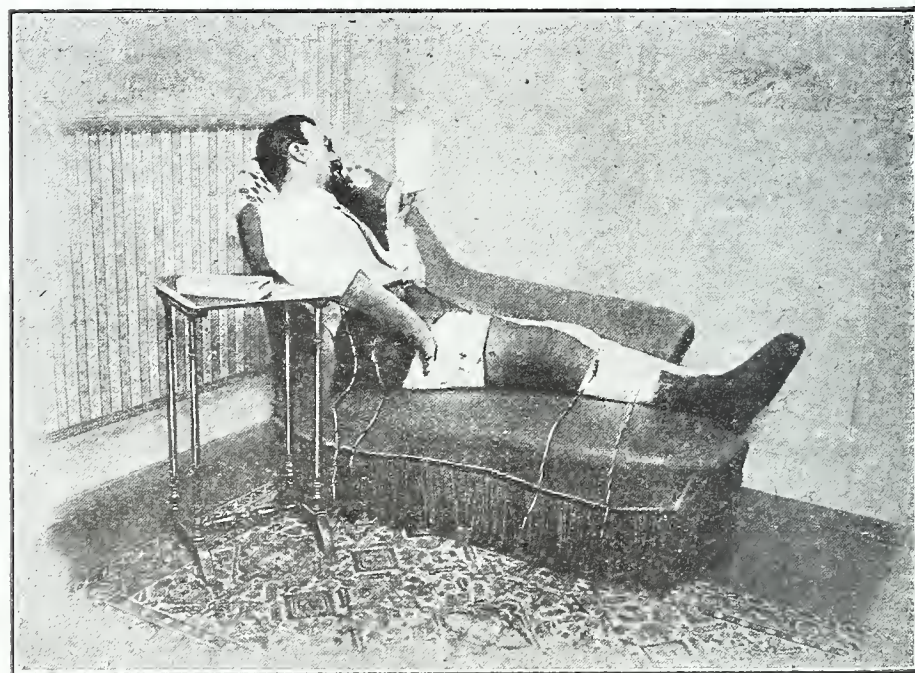
It will be noted that this action is of immediate effect from the beginning to the end; further, it produces neither smoke nor combustion, consequently there is no disengagement of gaseous products either injurious or troublesome. Finally, by observing very simple rules regulating the value of the current to be employed, the regulation of the disengagement of heat can be effected with astonishing facility without risk of bringing about

is maintained, are constructed with special processes of manufacture, and very simple precautions are taken to avoid a too great heating of the conducting wires, and running the risk of deteriorating such fabrics intended for warming at mild temperatures and particularly by contact.

In order to succeed in giving these fabrics great flexibility and suppleness, it was necessary in the first instance to have a textile and conducting thread which was suitable for all fabrics and for all weaving looms.

It is claimed that this French electro-thermic thread is a thread composed in such a manner that its textile part alone serves for traction when stretched, and that its conducting part is subject to no tension, and presents a large heating surface in proportion to its small section. This thread is very supple, does not buckle in weaving, and can be made in all sizes and with all textile materials according to the use for which it is designed in all kinds of fabrics, hemp, cotton, wool, silk, heavy and light fabrics.

It is held that such thermophile fabrics also preserve first their ordinary manufacture and then all their known appearances and all their



ELECTRICALLY HEATED RUGS, CARPETS, AND KNITTED FABRICS FOR LOCAL SWEATINGS IN MEDICAL WORK.

the incandescence of the conductor or any danger of fire.

These special properties have been utilized for electric heating for a long time; but it has not yet been applied largely to domestic uses, and in the most satisfactory manner, and at the same time the most practical and economical way.

Metallic webs forming rheostats have been manufactured, and asbestos fabrics used for heating; but such fabrics were intended particularly for high temperatures by radiation, and their employment was necessarily limited. They were not very well constructed and were wanting in flexibility. Such a heating could admit only of certain applications, but could not be introduced into modern houses in a practical manner.

The French thermophile fabrics, it

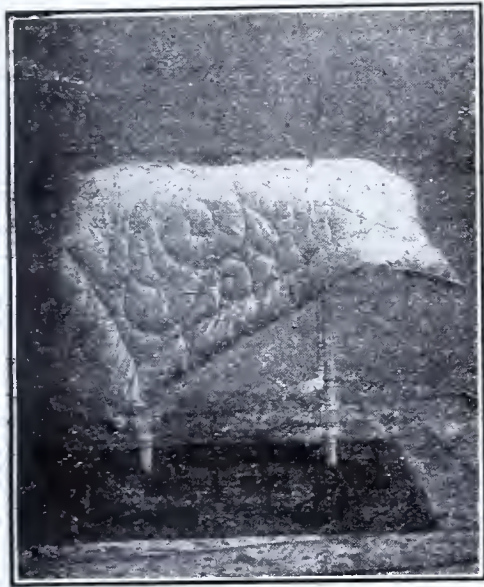
usual suppleness; lastly, they can be applied to all the uses of all similar fabrics, but have the additional property of heating.

The French thermophile fabrics are electrically auto-resistant exactly like an incandescent lamp: consequently, as they are employed under a determined electric tension, they can, when entirely spread out, only give the uniform temperature for which they were made, and that without any abnormal heating or dangerous electric current.

The woven electro-thermic threads are, it is stated, sufficiently fine to become their own cut outs in case of manifest imprudence, and the thermophile fabrics are regulated to avoid any short circuiting in their use.

The great number of electro-thermic wefts composing a circuit permits of

having between two neighboring wefts a difference of potential of only from half a volt to one volt at the most. Further in the case of multiple circuits these various units receive the current by collector wires specially insulated, and place a single pole in each selva of the fabric. Finally, the various circuits of the same fabric are branched in weaving in such a manner that the difference in potential is nil between the neighboring wefts of two successive circuits. There is therefore every security against short circuits, and to such a point that these fabrics may be wetted and then caused to dry by the current itself, thereby permitting all humid applications.



FRENCH ELECTRICALLY HEATED CARPET OR RUG AND COVERLET.

All danger is therefore absolutely removed and there only remains possible the stoppage of the current, of which the causes of breakage have been reduced to a minimum. First, the electro-thermic wires are perfectly buried and almost invisible in thermophile fabrics; they are so completely imprisoned in it that they remain intact in spite of the manipulations to which they are subjected, then these special wires never reach quite to the edge of the fabric: they stop short at a suitable distance and are protected absolutely so that they cannot be affected by wear.

It is claimed that in this way the electro-thermic threads leave the space for the insulated collector wires of the various circuits, and also permit the invisible and easy mending of a weft accidentally broken so it can be readily found and the circuit can be very rapidly closed again.

At the selva the collector wires can be provided with or without an external rheostat in order to couple, at will, multiple circuits for the purpose of obtaining various desired temperatures. In any case these thermophile fabrics demand in their management only the most simple and elementary precaution.

The hygienic applications include electric carpets, coverings, coverlets and knitted fabrics.

It will be noted that the heating furnished by the electric thermophile realizes considerable progress over all systems of heating heretofore used. Such heating can be obtained wherever the electric current is already used for lighting, and that by means

of carpets, coverings, coverlets and lace fabrics which, by their suppleness, elegance, and comfort are adapted to all the exigencies of the most luxurious modern installations.

In the house it is the least cumbersome, as a supple wire, an electric coupling, with suitable switches, and fusible plugs are sufficient to convey, with security, the current to the thermophile.

In the bed-room it is the cleanest method of heating; in fact, it creates neither dust nor odor, requires neither reservoir nor fuel. The carpet is a necessary element in the most simple furnishing and harmonizes with the business office as also with the elegance of the most luxurious saloon.

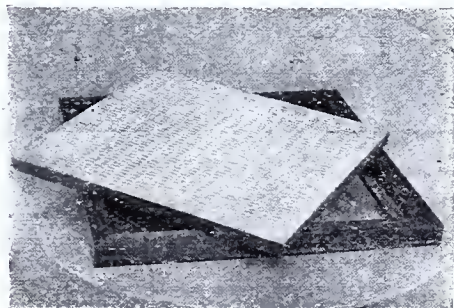
As a covering it is claimed also to be most hygienic. It disengages neither smoke, nor gas, and borrows no element from the atmosphere any more than an incandescent lamp. It produces no electric action. It warms persons, and even the air, by contact. The thermophile carpet creates the real heat siphon of the atmosphere. It warms the body giving a mild and absolutely uniform temperature, and finally realizes in the purest air cool heat and warm feet, the acme of hygiene.

As to the cost of operation it is most economic if it is duly considered that it affords the best heat over large surfaces and that it instantaneously transforms into heat all the electricity it receives.

It is held that the electric thermophile by all its advantages of comfort and hygiene offers the ideal system of domestic heating. The Oriental Gobelin is woven with electro-thermic threads and with all the most beautiful coverings and light coverings for long chairs, of instantaneous bed warmers, of elegant counterpanes of great luxury, in which warmth is obtained at will.

It is stated that all kinds of material can be employed in the manufacture and coverings of thermophile fabrics, in order to permit the most perfect applications in our modern residences.

The electric thermophile is made generally so as to give 85° to 95° for carpets, and 70° to 80° F. for coverlets, above the surrounding temperature. It can be made for all temperatures, but those mentioned are the most agreeable in order to avoid being inconvenienced by too great a heat; if these temperatures appear low at first, and particularly to the simple touch, their use for some moments is sufficient to fully demonstrate that these tem-



ELECTRIC FOOT WARMER.

peratures are sufficient and comfortable.

For medical purposes the backs of chairs or shawls of knitted electro-thermic threads are very practical for warming the back, arms, and loins of rheumatic subjects. Electric coverings and electric carpets are above all the indispensable complements in winter to preserve and continue the good effects of thermal cures made during the summer with a view to fortify muscles and nerves in the most severe cases of arthritis and sciatica.

Tea Cultivation in America.

The steady and growing demand for tea in the United States has caused efforts to be made for the propagation of this exotic product within our own territory. The most serious attempt in this direction was made in South Carolina, as a private enterprise, some years since. As a result, a shipment of the first crop of tea ever produced in the United States by a commercial organization was made last season. The company has 130 acres under cultivation, and the output is fully 200 pounds to the acre. The crop altogether amounted to upwards of six tons of high grade tea, which was satisfactorily disposed of through the usual channels of tea commerce. Efforts have been made to introduce machinery, where possible, and these have caused the invention of a number of very useful labor saving devices, which have placed a large part of the work connected with the manufacture of tea on a machine basis.

In its native soil in the East, the handling of tea is done much less expeditiously. The famous Oolong tea, which comes from China, is picked by women and children, and as picked it is placed in closely woven baskets, which are usually lined with jute cloth. When delivered by the pickers to the curing house, the leaves are spread out in the open air, in the sunshine if possible, on the bamboo mat or in trays, and are stirred every few minutes until the leaves are slightly wilted and signs of fermentation are visible. The tea is then placed in trays in a rack, one above the other, with space between to permit circulation of air. In these trays the leaves are again stirred and allowed to ferment for a couple of hours; then a large rack of tea—about 40 pounds—is turned into a bamboo tray and manipulated for two hours more, at the end of which time the leaves are somewhat dry and have the odor of prepared tea.

The leaf is then taken in lots of 5 pounds and placed in metal pans over charcoal fires hot enough to wilt the leaf, the latter being rapidly stirred all the while. The leaves are then rolled by hand; then dried again in the pan, and a second time rolled. This prepares the tea for temporary keeping; it is known as green leaf, and is packed in bags and transported to the firer for export. This final firing is done in bamboo baskets, giving the name "basket fired" to the product. The firing which produces the characteristic Oolong is generally done in a room containing a brick platform about 20 inches high, in which are round holes about 2 feet across, and about a foot apart. In each of these holes a charcoal fire is built, and the charcoal is burned until the flame disappears, the room becoming a great furnace into which the coolies rush with covered mouths and nostrils to stir the fires and prepare the little furnaces. When finally the charcoal in each hole becomes a bed of live coals without flame, it is covered with charcoal ashes to temper the heat and preserve the fire. The entire room is still hot and is kept so for days at

a time. Ordinarily it requires perhaps 12 hours to burn the charcoal to the right condition and have the room at a proper temperature, the covered charcoal giving off a steady heat.

The firing is done in bamboo baskets about 3 feet high and a little over 2 feet in diameter, open at both ends and with a sieve placed a little below the center as a bottom. Such a basket is put over an open hole in the platform, and about 7 pounds of the green leaf are placed in it. The leaf is practically untouched for three hours, until the contents of the baskets have become thoroughly and evenly heated. Firers then pass from basket to basket stirring the leaf, so as to keep the drying process even and regular. Ordinarily, about an hour between stirrings is sufficient. It takes from 7 to 12 hours of such firing to thoroughly evaporate moisture from the leaves, baskets generally being set in the evening and removed in the morning, the tea being boxed while warm. The firing of the tea also varies for the variety desired, heavily fired teas being desirable for some markets because of the darker infusion they give.

Machine curing of tea has been attempted in China, but the growers there declare that the results are not satisfactory. It is claimed that the tea derives more or less of its meritorious qualities from the manner in which the leaf is handled, and such depends upon little things which a machine cannot accomplish. The same claim, however, has been made in every industry before hand labor was replaced by machinery, and it is probable that the inventive genius of America will be equal to the task, now that the plant is growing on our soil. An interesting innovation in South Carolina has been the utilization of the broken leaf in the form of tablets. The tea powder contains sufficient oily material to cement the mass under high pressure into firm tablets, which readily dissolve in hot water. The compact form of the tablets does not interfere with the desirable qualities of the tea, and the product is very popular where compactness is desired.

A Novel Straight Edge.

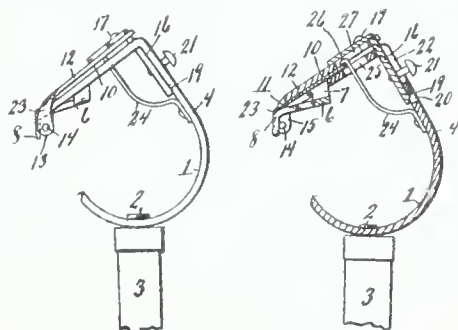
A new straight edge for use by paper-hangers and other artisans, has been patented by Mr. Oliver Messinger, of Sheridan, Wyoming. The principal feature of this straight edge resides in the fact that it is a compound structure, which will not warp or crack, and will have hard working-edges that are not apt to be injured or destroyed. The patent covers both the method of manufacturing the straight edge and the article itself. In producing the device, a body is formed of longitudinally disposed strips of different widths, the outer strips being of harder wood than the inner strips. This body is then sawed longitudinally through the strips to form sections. The sections are turned end for end, and are glued flat against each other, with the joints of the strip sections disposed out of alignment. This reversal of the sections prevents the warping of the body, and the hard wood outer sections produce margins that are not apt to become injured or marred. Suitable leveling and plumb glasses are secured in the body and serve to complete the structure.

CLEVER NEW PATENTS.

Safety Razor.—Kettle Cover and Strainer.
Water Closet Attachment.—Horse
Shoeing Stand.

Safety Razor

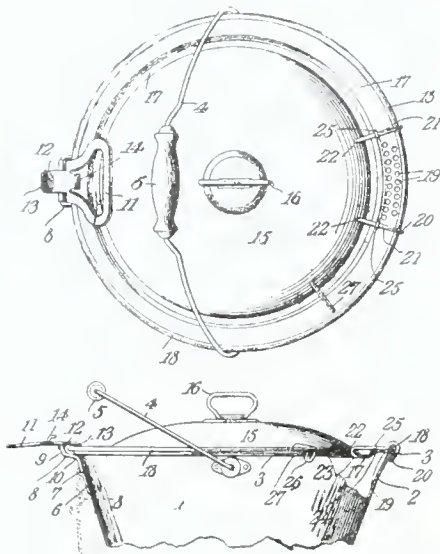
The American Safety Razor Co., of Adrian, Mich., has secured control of a patent recently granted to Edward B. Gibford, of the same place, on a safety razor. The primary object of the inventor in this particular instance has been to provide a blade holder of such construction that it will securely hold a thin flat blade, and so brace and support the same at its cutting edge, that there will be no springing action because of its thinness, producing a safety razor that possesses all the requisite qualities of such an instrument. A casing 1 is employed, one end of which is secured as shown at 2, to a handle 3. The back 4 of the casing inclines forwardly, and from the upper edge of the back, projects forwardly and downwardly at right angles to the blade supporting plate. The central forward portion of the blade supporting plate is struck downwardly, producing a depressed plate 6, separated at its rear edge from the supporting plate by a longitudinally extending slotted opening, and having upon its forward edge the downwardly turned guard teeth 8. The blade 10 is made of comparatively thin, flat steel of uniform thickness, and is ground upon one edge only. This blade is supported at its rear edge upon the face of the plate, while its forward edge rests upon the teeth 8, of the guard plate 6. The blade is



clamped in position upon the supporting plate by means of the hinged clamping plate 12, having the short downwardly extending arms 13 at its ends adjacent to its forward edge, which are hinged at 14 to the depending ears 15, on the end portions of the blade supporting plate. By thus hinging the clamping plate to the blade supporting plate, the clamping plate is permitted to swing over onto the blade and securely clamp it in position, said clamping plate being locked in place by means of the spring tongue 16 which is secured thereto at 17, and is bent downwardly so as to lie in a notch formed in the rear edge of said plate 12, having upon the free end thereof a catch 19 adapted to engage in an aperture 20 in the back of the casing. For the purpose of releasing said spring tongue, it is provided with a button 21 projecting therefrom, having a stem which lies in the slot 22 formed in the back of the casing. By pressing inwardly upon said button, the spring tongue may be disengaged to allow the clamping plate to be swung upwardly, thereby releasing the blade, enabling it to be removed and a new blade to be replaced in the holder if desired.

Kettle Cover and Strainer.

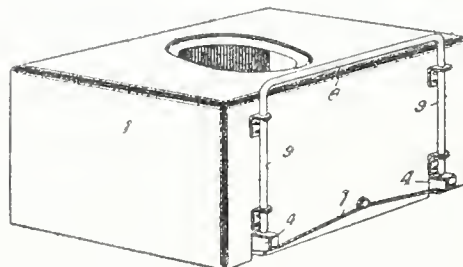
John H. Wilson, of New Kensington, Pa. has assigned to The Aluminum Cooking Utensil Co., of Pittsburg, Pa., a patent that he has recently secured on a kettle cover. The object of the invention is to provide a cover which can be utilized as a strainer, and which has means for holding the same against rotation, so that the strainer portion will remain in a predetermined position. The kettle or receptacle 1 is provided at one side with a spout 2 reinforced by a terminal bead 3, while the opposite



side of the kettle has an ear 6 to which is pivoted a link 8. A handle 11 is pivoted on this link, and has an overhanging downturned tongue 13. The cover 15 is provided with a marginal perforated portion 19 arranged to be placed directly over the spout, and this cover carries a yoke 20 that is arranged to engage beneath the bead 3. The handle 11 is so located that the tongue 13 can be engaged over the margins of the cover, and thus said cover can be securely clamped in position with the perforated portion registering with the spout. When so arranged, it will be evident that the handle is not disposed near any steam escape, and danger from burning is thus avoided. The structure moreover is so arranged that the perforated portion of the cover can be placed out of register with the spout, and the cover thus made practically steam tight.

Water Closet Attachment.

An important improvement in closets has been patented by McDuffee Bradford, of Nocona, Tex. The invention is designed for the re-



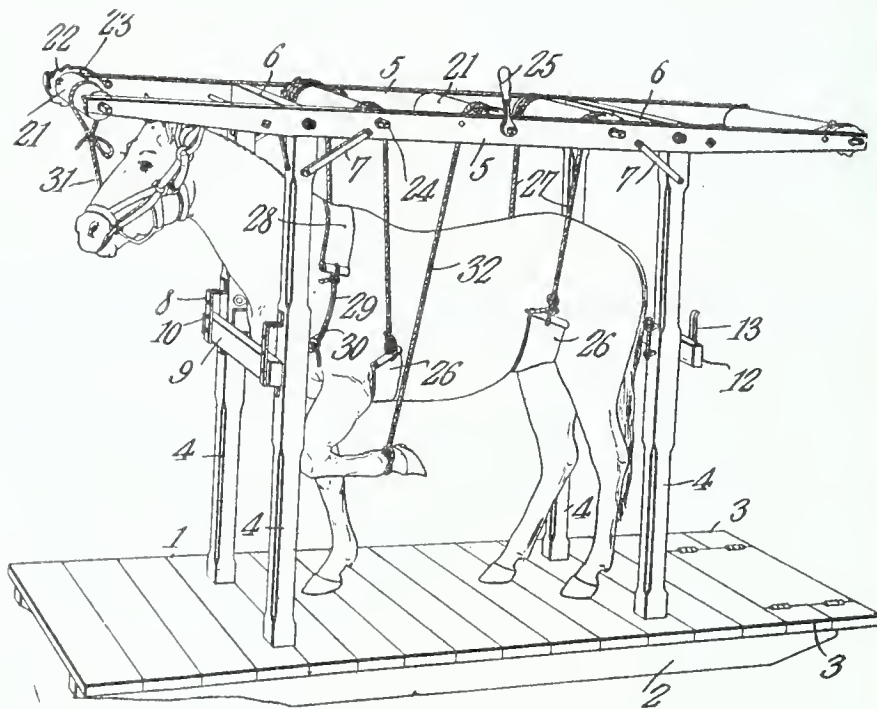
ception of excrement, and being devoid of running water to carry off the faeces, it has for its object the confinement of odors and vapors when the

closet is not in use. The invention contemplates closures mounted to swing, and normally extending over the pit so as to prevent rising of odors therefrom into the surrounding air, and combining with such closures means for opening the same when the closet is in use, the weight of the person being utilized as a means for opening the closures and holding the same open during the occupancy of the seat. The closet 1 may be of any well known form, and is provided with a bottom consisting of hinged leaves 2 that swing upwardly to open position. Levers 4 are located beneath the leaves, and project beyond the front

wall of the closet. Secured to the rear ends of the levers are bell cranks having long arms 6 which engage the walls, and short arms which bear against the under sides of the leaves. A pressure bar 8, fastened to the front side of the closet wall, has vertical arms 9 that bear upon the projecting ends of the lever 4. A spring 7 serves to normally hold said projecting ends upwardly. With this construction, under normal conditions, the leaves 2 are closed, but when the bar 8 is forced downwardly, the levers 4 will be operated so that the bell cranks 6 will raise the leaves, and thereby open the bottom.

Horse Shoeing Stand.

A new horse shoeing stand is the invention of Columbus M. Davis, of Waggoner, Illinois. It is particularly designed for transportation from place to place, which renders it especially adapted for army use. It is the primary object to provide holding means which will prevent the horse, while being shod, from subjecting the operator to any injury from the struggles of the horse, as well as prevent injury to the horse itself. A movable platform 1 is employed that is arranged to be placed upon a light wagon or wagon running gear, and upon this platform is erected a frame comprising standards 4, with



longitudinal beams 5 thereon connected by cross pieces 6. A number of winches 21 are journaled in the beams 5, and are provided with cables 27 and 32, which, together with bands 26, can be employed for securely holding an animal during the shoeing operation. Bars 9 and 12 are located at the ends of the frame and serve to hold the animal in place.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

SIMPLEX ELECTRIC HEATING CO. v. LEONARD, et al.

(Circuit Court, S. D. New York. July 7,
1906. 147 F. R. p. 744.)

1. PATENTS—INFRINGEMENT—BILL—PARTIES.

Where, in a suit to restrain the infringement of a patent, the facts alleged and admitted showed that defendant L. used the L. Co. merely as a name or cloak under which to commit acts of infringement, that L. was bound by a decree in favor of plaintiff in another suit for infringement, and that the L. Co. was really the same thing as L. himself, the company was bound by such decree, and both were therefore proper parties to the bill.

2. SAME.

In a suit to restrain the infringement of a patent, a party who was alleged to be encouraging the manufacture and sale by the other defendants of the infringing device, and was closely connected with the transactions complained of, was a proper party to the bill.

BEID-ARCHER CO. v. NORTH AMERICAN CHEMICAL & ENGINEERING CO. et al.

(Circuit Court, S. D. New York. August 1,
1906. 147 F. R. p. 746.)

PATENTS—INFRINGEMENT—INJUNCTION—LACHES.

A bill to restrain the infringement of a patent was verified June 27, 1906, and was accompanied by a motion for a preliminary injunction returnable July 12th. The bill was filed June 28, 1906, and the subpoena served July 29th following. The patent was dated July 19, 1889, and expired July 9, 1906. The bill did not fix the date of the alleged infringement, beyond the allegation that it occurred within six years prior to the filing of the bill, complainant knowing at the time the bill was filed that it could not be brought to the attention of the court in time to obtain injunctive relief; and the only proffered excuse for complainant's laches was that there was no appointed sitting of the court at which complainant could be heard until three days after the patent expired. Held, that the sole practical purpose of the bill being to collect damages, it would be dismissed for laches.

LOUIS DE JONGE & CO. v. BREUKER & KESSLER CO.

(Circuit Court, E. D. Pennsylvania. Sept. 7,
1906. 147 F. R. p. 763.)

COPYRIGHTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction against the alleged infringement of a copyright, the effect of which will be to interfere with defendant's business, will not be granted where complainant's right is doubtful on the showing made; but defendant may be required to give a bond for complainant's protection in case he is successful on a full hearing.

CONDERMAN v. CLEMENTS.

(Circuit Court of Appeals, Fourth Circuit.
July 14, 1906. 147 F. R. p. 915.)

1. PATENTS—INVENTION—PLEASURE WHEEL.

The Conderman patent, No. 669,621, for a pleasure wheel similar to the Ferris wheel, except that it is lighter and the parts are detachable, so that it may be taken apart to facilitate its transportation from place to place, is void for lack of invention: the only change over prior portable structures of the kind being such as required only mechanical skill to make.

2. SAME—SUIT FOR INFRINGEMENT—DEFENSE OF LACK OF INVENTION.

It is the duty of the court to dismiss a suit brought to restrain infringement of a patent where the structure is not patentable, even though the defense be not set up in the answer.

CRAMER v. SINGER MFG. CO.

(Circuit Court of Appeals, Ninth Circuit.
August 13, 1906. 147 F. R. p. 917.)

1. WRIT OF ERROR—REVERSAL—COMPLIANCE WITH MANDATE.

The Supreme Court having held in an action at law for the infringement of a patent by the device of another patent, that from a

comparison of the two patents alone, without the aid of extrinsic evidence, it appeared that there was no infringement, and remanded the case to the Circuit Court for a new trial, that court was required on such trial to direct a verdict for defendant regardless of any new evidence.

2. PATENTS—INFRINGEMENT—SEWING MACHINE TREADLE.

The Cramer patent No. 271,426 for a sewing machine treadle is not infringed by the device of the Diehl patent No. 306,469.

ALEXANDER CAR REPLACER MFG. CO. v. HEITZMANN TOOL & SUPPLY CO.

(Circuit Court, D. New Jersey. August 27,
1906. 147 F. R. p. 921.)

PATENTS—INFRINGEMENT—CAR REPLACER.

The Alexander patent, No. 523,563 for a car replacer, claim 3, covering a device for use in replacing the wheels of derailed cars or locomotives on the track, construed and held not infringing.

G. W. COLE v. COLE'S MANY-USE OIL CO. et al.

(Circuit Court, S. D. New York. July 20,
1906. 147 F. R. p. 930.)

TRADE-MARKS—SUIT FOR INFRINGEMENT—INJUNCTION.

Evidence held not to entitle complainant to a permanent injunction against infringement of a trade mark and unfair competition broader in its terms than a preliminary order which was entered with defendant's consent, and complainant adjudged to pay the costs made since the entry of such order.

LOOK et al. v. SMITH.

(Circuit Court of Appeals, Sixth Circuit.
June 5, 1906. 148 F. R. p. 12.)

PATENTS—NOVELTY—SPRAYER.

The Smith patent, No. 651,938, for a sprayer, is void for lack of novelty.

CONNORS et al. v. ORMSBY.

(Circuit Court of Appeals, First Circuit.
June 28, 1906. 148 F. R. p. 13.)

1. PATENTS—ACTION FOR INFRINGEMENT—ISSUE AS TO INVENTION.

In an action at law for infringement of a patent, the question of invention is ordinarily for the jury, subject to the direction of the court concerning the construction to be put on the patent; but, if the patent appears to the court to be plainly invalid for want of invention, a verdict for the defendant should be directed as in other cases where the evidence is not sufficient to justify a verdict for plaintiff.

2. SAME—INVENTION—TRANSM LIFTER.

The Ormsby reissued patent, No. 11,639 (original No. 466,081), for a transom lifter, is void for lack of invention.

STAPLES & HANFORD CO. v. LORD. LORD v. STAPLES & HANFORD CO.

(Circuit Court of Appeals, First Circuit.
April 27, 1906. 148 F. R. p. 16.)

PATENTS—INFRINGEMENT—SPRING SUPPORTS.

The Staples patent, No. 474,536, for spring supports formed of wire for seats, etc., was not anticipated, and discloses invention, but is limited to such supports having bends in the wire to receive the springs and to prevent them from slipping thereon. As so construed claims 1 and 3 held infringed by one structure made by defendant, and not infringed by another.

INDIANA MFG. CO. v. J. I. CASE THRESHING MACH. CO.

(Circuit Court, E. D. Wisconsin. August 22,
1906. 148 F. R. p. 21.)

1. PATENTS—SUIT FOR INFRINGEMENT BY VIOLATION OF CONDITIONS OF LICENSE CONTRACT—LEGALITY OF CONTRACT.

Where a bill alleges infringement of patents by the violation of the conditions of a license contract thereunder, and seeks in effect the specific enforcement of the contract, its legality is involved directly and not collaterally, and must be established before equity will grant relief.

2. MONOPOLIES—COMBINATIONS IN RESTRAINT OF TRADE—LICENSE CONTRACTS UNDER PATENTS.

Conceding that a number of patents relating to the same art may be united by purchase in the same ownership, and that the

grant of combination licenses thereunder on conditions specified may be within the lawful monopoly given by the patent law, yet to be immune from the operation of Anti-Trust Law of July 2, 1890, c. 647, 26 Stat. 209 [U. S. Comp. St. 1901, p. 3200] the contract must be referable solely to the inventions under the patents, and intended to secure a monopoly in the beneficial use of specific inventions only; and where it extends beyond such purpose, and is intended to create a monopoly in the manufacture of the article to which the patents relate by securing and holding for the benefit of the parties all patents relating thereto under which such manufacture may be carried on, and not for the protection of patent rights, it may constitute a conspiracy and combination in restraint of trade in violation of the law.

3. SAME.

Complainant acquired by purchase the ownership of, or exclusive license to use, 21 United States and two Canadian patents, all relating to pneumatic straw stackers, and confederated all of the manufacturers of threshing machines in the country in a plan of uniform licenses under the combined patents with a uniform price fixed for the product and payment of a royalty to complainant for each machine until the end of the full term of any of the patents or of any which might thereafter be acquired by complainant. It thereafter acquired numerous other patents, until it held over 100 in all. The devices of such patents were not all capable of conjoint use in a single machine. None of them covered the pioneer invention of a wind stacker. A number covered non-interfering devices performing the same functions and capable of independent use by different manufacturers and many were of no practical value, and not used by any of the licensees. Held, that the purpose and effect of such system of contracts was to create a monopoly in wind-stacker products without reference either to any specific invention or the validity of any patent; that the agreement fixing the selling price of any form of the product was not attributable to any patent in the list nor to specific invention in either of the patent devices, and was not within the protection of the patent law, and that the combination created by such contracts was in restraint of trade and illegal as in violation of Anti-Trust Law July 2, 1890, c. 647, 26 Stat. 209 [U. S. Comp. St. 1901, p. 3200] and the contracts not enforceable in equity.

UNITED SHOE MACHINERY CO. v. DUPLESSIS SHOE MACHINERY CO.

(Circuit Court, D. Massachusetts. July 9,
1906. 148 F. R. p. 31.)

1. PATENTS—LENGTH OF TERM—PRIOR FOREIGN PATENT.

Formal identity of claims is not necessary to constitute identity of a United States and a foreign patent, within the purview of Rev. St. § 4887 [U. S. Comp. St. 1901, p. 3382], but substantial identity of the invention as covered by the claims is sufficient.

2. SAME—EFFECT OF TREATY.

Article 4 bis, inserted in the international convention for the protection of industrial property of March 20, 1883, by the additional act proclaimed by the President, August 25, 1902 (32 Stat. 1936, 1939), did not have the effect of changing the term of a patent granted by the United States to a citizen thereof, as that term is fixed by statute; and such a patent, granted prior to January 1, 1898, and which is limited by the provisions of Rev. St. § 4887 [U. S. Comp. St. 1901, p. 3382], to the term of a prior foreign patent for the same invention, is not extended by such additional act.

3. SAME—EXPIRATION—SOLE SEWING MACHINES.

The French and Meyer patent No. 412,704, for a sole sewing machine, expired Sept. 17, 1902, with the expiration of the term of the prior British patent, No. 13,366, of 1888, granted to the same patentees for substantially the same invention.

KEASBEY & MATTISON CO. v. AMERICAN MAGNESIA & COVERING CO.

(Circuit Court, E. D. Pennsylvania. August 27, 1906. 148 F. R. p. 91.)

APPEAL—DETERMINATION—MANDATE OF APPELLATE COURT—COMPLIANCE—PATENTS—DECREE IN SUIT FOR INFRINGEMENT.

Where a decree of the Circuit Court adjudging the invalidity of a patent in a suit for its infringement has been reversed by the appellate court, and the case remanded with express direction to enter a decree "declaring the validity of the patent, and adjudging that claim 1 of said patent has

been infringed by the defendant," the Circuit Court has no discretion to vary from such mandate by adjudging only that claim 1 of the patent is valid and infringed.

B. F. AVERY & SONS v. J. I. CASE

PLOW WORKS.

(Circuit Court of Appeals, Seventh Circuit.
October 2, 1906. 148 F. R. p. 214.)

PATENTS—VALIDITY AND INFRINGEMENT—PLOWS.

In the Avery patent, No. 659,771, for a double moldboard plow, having adjustable depth-runners and an adjustable rudder, claims 2 to 6, inclusive, which are broad claims, are void for anticipation, their language being such that they may be read upon prior structures. Claims 7 and 8, which disclose the specific invention, cover a combination of old elements, not merely new in specific construction, but new in kind, and which produces a new result, and they disclose invention, and are valid. Such claims also held infringed by a structure which differs from that of the patent only in the location of one of the parts, the change being immaterial to the result.

HUNT, HELM, FERRIS & CO. v. MILWAUKEE HAY TOOL CO.

(Circuit Court of Appeals, Seventh Circuit.
August 11, 1906. 148 F. R. p. 220.)

PATENTS—INFRINGEMENT—HOIST.

The Ferris patent No. 584,340 for a hoist, covering a device attached to the sheave block for clamping and unclamping the free end of the rope, conceding invention, is of narrow scope, in view of the prior art, in the way of simplifying the form and cheapening the cost of the device, and must be limited to the particular form shown. As so construed it is not infringed by the device of the Gutenkunst patent No. 785,385, which, while functionally equivalent, employs different mechanical means.

WOLD v. THAYER & CHANDLER et al.

(Circuit Court of Appeals, Seventh Circuit.
October 2, 1906. 148 F. R. p. 227.)

1. PATENTS—ANTICIPATION—AIR BRUSH.

A patent for an air-brush used for making pictures, in which by a combination device liquid colors are atomized and thrown upon a paper or canvas by a jet of compressed air, was not anticipated by oil burners having concentric oil and steam nozzles; invention being required at least to adapt the principle to use in the different art.

2. SAME—VALIDITY—ESTOPPEL BY ASSIGNMENT.

A patentee who has assigned his patent is estopped to deny its validity.

3. SAME—INFRINGEMENT—AIR BRUSH.

The Burdick patent, No. 474,158, for an air brush and the Wold patent, No. 555,669, for improvements thereon, held not anticipated, valid, and infringed.

FIELDING et al. v. CROUSE-HINDS ELECTRIC CO.

(Circuit Court, S. D. New York. July 5,
1906. 148 F. R. p. 230.)

PATENTS—INFRINGEMENT—RECEPTACLE FOR INCANDESCENT LAMPS.

The Fielding patent, No. 714,290, for improvements in receptacles for incandescent lamps covers a combination of old with two new elements, and, while it must be conceded patentable invention, taking into consideration the immediate acceptance of the device by the public, it must be strictly construed and limited to the precise combination shown in view of the prior art. As so construed and limited, held not infringed.

ARNOLD MONOPHASE ELECTRIC CO. v. WAGNER ELECTRIC MFG. CO. et al.

(Circuit Court, S. D. New York. September 19, 1906. 148 F. R. p. 234.)

PATENTS—SUIT FOR INFRINGEMENT—TITLE OF COMPLAINANT.

A contract between a patentee and complainant's assignors construed in the light of the correspondence between the parties, and held not to operate as an assignment of the legal title to patents, because of conditions therein which were precedent to the becoming absolute of the assignment, and which were neither performed by the assignee, nor waived, so that complainant was without title to support a suit for infringement against subsequent licensees of the patentee.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured
through the Patent Soliciting Office
of E. G. Siggers, Patent Lawyer,
Washington, D. C.

Frank Hoskavec and John J. Roubal, Bruno, Neb. Corn Cultivators.—This machine, which is designed for cultivating corn, is capable of adjustment to suit the width of the rows, and is adapted to cut down the growth of weeds in the furrow and on the sides of the rows, and will not become clogged with the same. The cultivator consists of runners, front and rear arches connecting the runners, the rear arches being provided with guides, plow beams arranged in the guides of the rear arch and pivoted at the front arch, and a rock shaft mounted on the rear arch and connected with the plow beams for raising and lowering the same.

Storm A. Burgett, Aurora, Ill. Attachment for Carpenters' Squares.—The invention relates to an attachment for carpenters' twenty-four inch steel squares, and it adapts the same to be employed for easily marking off miters, mortises, gains, tenons, splices, etc. with great rapidity and accuracy. It embodies a plurality of spaced longitudinal bars, cross pieces connecting the longitudinal bars and provided with means for securing them to a square, and a combined miter bar and brace located at one end of the attachment and arranged at an angle, and provided with means for securing one end of it to the square.

George C. Griffin, Houston, Tex. Ditching Machine.—The invention relates to ditching machines employed in railroad work, wherein shovels are drawn alongside a car and mechanism is mounted on the car for raising and lowering the shovels to dump the same. With these machines as heretofore constructed, a crew of eight men exclusive of the engineer and conductor have been required, but with the present machine, two are sufficient. It has been the practice to employ long handles or poles extending rearwardly from the shovels to direct the same, but these have proven extremely dangerous, and in the present construction they are entirely eliminated. The guiding means is mounted on the car and consists of upright stems connected to the shovels and slidably mounted in guides on the car. Cables with drums and gearing control the operation of the stems, and the mechanism is such that one man can direct each shovel. A further advantage for this machine resides in the fact that it can be used for spreading the dirt after it has been deposited on a fill, thus eliminating the necessity for another separate machine, as has heretofore been employed.

Joseph W. Maxwell, Louisville, Ky. Combined Shovel and Poker.—The device consists of a handle shank having a poker terminal carried by one end of the same and immovable with respect thereto. A shovel blade is pivoted to this end, and is movable to a position alongside the poker terminal, being also capable of swinging to a position wholly in rear thereof. A handle pivoted on the other end of the blade, has a link connection with the shovel blade. This device can be used either as a poker or as a shovel, and the two parts combined form a pair of tongs. Moreover when the shovel is swung rearwardly, an extended base is formed which will support the handle. The handle may be in the form of a hammer, and claw jaws. A useful combination tool is thus produced.

John L. Clark, Bangor, Me. Plaque Holder.—This device is intended for hanging ornamental plates, plaques and similar articles. A circular dished disc is employed in which a series of strips are slidably engaged, these strips being formed of metal that can be easily bent and having terminal hooks that engage over the edge of the plate or plaque. One of the strips furthermore has a reverse or serpentine curve forming a loop in which a hanger ring is placed. The device is readily adjustable to different sizes of plaques and can be cheaply manufactured.

Allen Glenn, Scranton, Iowa, inventor; Silas G. Kious, assignee, one-half interest, same place. Tile Molding Machine.—The machine is particularly intended for manufacturing cement or concrete tiles, and is so constructed that tiles of different diameters may be made thereon. A hopper for the material is employed that is located directly over a revolving table on which the mold is placed. The mold consists of an outer sectional wall and an inner core, the latter having an upstanding gudgeon that is engaged by a swinging journal box. Gearing is provided for rotating the table and mold and for rotating a feeder or stirring device that is located within the hopper. A reciprocating tamper operates in the mold, and has a rack secured thereto. A rotatable mutilated gear connected to the driving means, operates the rack. A scraper cooperates with the upper end of the mold, and a depending arm from the scraper carries a brush which engages the table outside of the mold to sweep all material away from the mold body.

John F. Johnson, Chester, Pa., inventor; Johnson Motor Co. of the same place, assignee, entire right. Two patents.—The first of these patents relates to an explosive engine of the reciprocating piston type, and one of the features relates to novel means of a simple nature for supplying motive fluid charges to the engine cylinder, so that the burnt gases will be thoroughly expelled without the loss of any material part of such charges. Another feature resides in means whereby the power of an engine may be increased by the addition of other motor units without any material alterations in the working parts of the original engine. These additions are substantially duplicates of the original and readily applicable thereto. Each unit consists of a cylinder having a compression chamber at one end, with a piston operating in the cylinder. A tubular extension is carried by the piston and has communication with the compression chamber. This extension is provided with lateral ports located at different distances from the piston. A cut off plunger is arranged within the extension, and has an annular packing groove. A supporting rod holds the plunger against movement with the extension and has a passageway communicating with the annular groove; and extensions are carried by the inner ends of the flange and effect the closing of certain of the ports. With this structure, all that is necessary to add an additional cylinder is the employment of longer extensions and longer plunger stems. The additional cylinder is mounted directly on the head of the original cylinder, and the second piston is connected by the tubular extension to the first piston.

The second patent covers ignition mechanism, so constructed that a plurality of igniters can be operated from a single source of electrical energy without causing the formation of arcs at the switch mechanism. To this end, means are employed whereby the secondary circuit is closed prior to the closing of the primary circuit, and the primary circuit is opened

prior to the opening of the secondary circuit. The arrangement is such that the time of ignition may be varied with respect to the movement of the piston. A lever is employed that carries a set of contact elements, and a swinging contact element co-operating with the first mentioned contact elements is slidably and swingingly mounted on the lever, being operated by a cam on the engine shaft. The above mentioned contact elements are employed for making and breaking the secondary circuit, and another circuit closer for the primary circuit is likewise mounted on the lever, and includes a reciprocating device operating with the secondary circuit closer.

Eugene Weit, Sacramento, Cal., inventor; H. J. Goethe Co., Sacramento, Cal., assignee. Two patents.—Buggy Top Rest and Lock Hook.—The first patent discloses a buggy top rest adapted to be readily applied to a buggy and capable of affording a yieldable support for the top of the same, so as to prevent the top from being broken or otherwise injured when it is thrown back or folded, and when the buggy is traveling over rough places. The device comprises front and rear upwardly extending rigid forks having sides or arms spaced apart, and elastic cross pieces spanning the spaces between the sides or arms of the forks and arranged to receive a buggy top.

It is the object of the second invention to provide a hook in which a link or other connector is securely locked against accidental detachment, the structure of said hook being such that it can be formed of sheet metal stamped or punched by ordinary mechanism. It embraces a body stamped from sheet metal and comprising a plate having a front and rear end, a slot forming an upper overhanging bill, an article-receiving seat and an entrance mouth, a locking device stamped from sheet metal and having an edgewise swinging movement toward the rear end of the plate and across the mouth to close the same, and means stamped from the sheet metal of said body and located in rear of the locking device and in the path of movement of its lower rear edge, for stopping the device when said device is across the mouth and preventing its rearward movement from uncovering the mouth.

Carl W. Westerberg, De Kalb, Ill., inventor; Alfred E. Westerberg, De Kalb, Ill., assignee. Four-Way Gate Hinges.—It is the aim of this invention to provide a gate hinge, adapted to permit either end of a gate to swing in either direction to facilitate the operation of the gate, and to also provide one in which the movable members for unlatching or releasing the gate will be positively locked in engagement with the gate, so that there is no liability of either end of the gate being accidentally unfastened. The device embodies opposite hinge posts or supports, a swinging gate provided with upper and lower pintles, lower supporting brackets having eyes receiving the lower pintles, pivoted hinge members mounted on the posts or supports and provided with eyes detachably receiving the upper pintles of the gate, and operating mechanism mounted on the posts or supports and connected with the pivoted hinge members for swinging the same into and out of engagement with the gate.

Patrick F. Denning, Newark, N. J. Three patents. Holders, Clamps and Hat Hangers.—It is the aim of the first patent to provide a device capable of holding various articles, such as train orders, hats, coats, towels, etc., and having means for securely locking it upon the articles so held, so that they cannot be detached by an

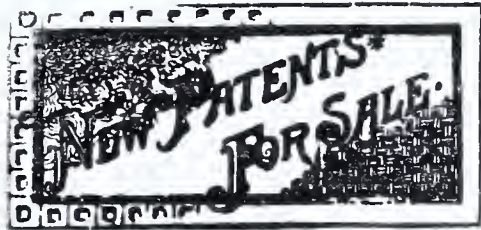
unauthorized person. It consists of a base having a housing at one end, a hollow post located on the housing, a clamp member pivoted within the housing and projecting therefrom and coacting with the base, a cap journaled upon the post, a cam located within the cap and coacting with the portions of the clamp member located on opposite sides of its pivot, and a locking sleeve rotatably mounted within the post and having a cam that engages the clamp member.

The device of the second patent is designed for holding various articles, such as towels, lace curtains, and the like, and is adapted to enable such articles to be readily placed in the clamp or holder and removed therefrom, whereby the article is prevented from being torn by the gripping mechanism. The device is provided with a clamping jaw arranged to engage the article to be held and having an opening, and a hinged dog mounted within the opening of the jaw and arranged to grip a portion of the article and clamp the same against the jaw.

It is the aim of the third invention to improve the construction of hat hangers, and especially those used in theatres, halls and various other places where it is customary for ladies to remove their hats. It is capable of clamping the rim of a lady's or gentleman's hat and of enabling the hat of a lady to be pinned to it, when the hat is made or trimmed in a manner which will not admit of its being clamped at the rim. The device may be readily applied to the back of a seat and will not present any projections liable to tear or otherwise injure dresses of delicate fabrics. The hanger comprises a casing having front and end openings, and a spring actuated lever mounted within the casing and extending through the end opening and provided with an exteriorly arranged clamping portion, and having a push button projecting through the front opening, said lever being pivoted at a point between the push button and the clamping portion.

Windfrey S. Morgan, Lewisville, Ark. Hand Fertilizer Distributer.—The invention of this patent provides an ingenious construction, adapted to be carried by the operator and capable of easy operation to discharge the desired amount of fertilizer. It comprises a hopper provided with a depending tube, an operating rod extending through the tube and having agitating means for engaging the fertilizer, and a flat plate connected to the lower end of the operating rod and adapted to fit against the lower end of the discharge tube to form a closure for the same. The plate, which is centrally secured to the operating rod, is also connected to the same by a pair of combined bracing and guiding rods, consisting of upper converging portions and lower parallel portions, the latter being adapted to engage the interior of the discharge tube for holding the plate against lateral movement when the discharge tube is closed.

Faines N. Silvey, Boaz, Ala. Hot Air Engine.—The object of the invention is to provide a structure wherein the heating of the motive fluid is easily accomplished, while the heater supplies a draft to keep a portion of the engine cool in order to effect the contraction of the fluid. The engine in the present case comprises right angularly disposed cylinders, in one of which the usual reciprocating piston operates. A reciprocating displacer body operates in the other. Novel means are employed for connecting the same to the piston to effect its proper operation. A vertical flue extends through the cylinder in which the displacer body operates, and the body is in the form of a cylinder surrounding the same. A suitable heater is placed in the flue.



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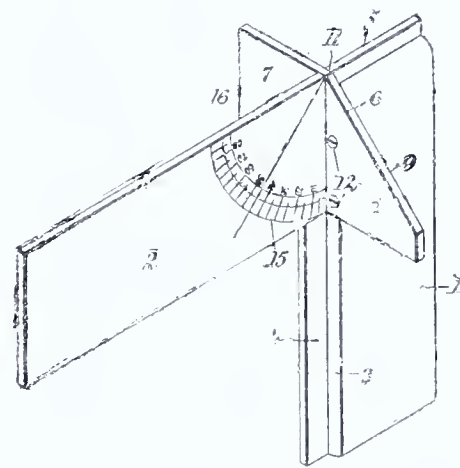
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The Protection of Trademarks.

There is perhaps no more valuable piece of industrial property than a good trademark. If it comes to be generally known as representing a certain reliable product, it is worth more to the manufacturer than can be calculated in mere dollars and cents. Indeed, there have been famous instances in which a million dollars was offered for a trademark, and refused—and this, too, on a tiny article which could be manufactured for a nickel. But the article had come to be in universal demand, and the public knew it through the trademark, so that the latter had assumed an arbitrary value to the manufacturer that placed it beyond price.

Although the importance of the trademark has been fully appreciated only within the last quarter of a century, its use has now spread to all classes of manufacture, and it is today one of the most influential elements in the world of commerce. For customers have come to know goods by their labels, and to ask for that particular brand, refusing to accept any substitute. Half a dozen instances will occur to the reader, in which his daily purchases are regulated by the above habit. To the mind of the public, a trademark, once established, is a guarantee of the integrity of a product, and it has been a most potent factor in keeping up the standard of this product; for manufacturers have learned that it is suicidal, from a commercial point of view, to place an article on the market that does not fulfill the claims made by the trademark.

But precisely because the trademark so efficiently protects the goods it designates, it needs protection itself. Its success makes it a mark for unscrupulous imitation. Dishonest manufacturers copy a trademark as closely as they dare—often so closely as to deceive the casual glance—and so induce the public to buy spurious articles. There are already laws against such counterfeits, but they should be made more stringent and far-reaching. The legitimate trademark should be effectively protected.

Clean Money.

The importance of having money clean, not only in the moral but in the material sense, is brought out by recent investigations in New York laboratories, which have shown that of all the methods of transmitting germs and microbes, money is one of the most effective. When you take a dirty bill, you put into your pocket over seventy thousand bacteria, active agencies of disease. A moderately clean bill has a lively population of over two thousand. Nor is the small currency exempt. A dime shelters forty of these undesirable guests, and the average penny in general circulation has twenty six. These figures are startling, and it is time that some movement were made to purify our purses. The U. S. Treasury redeems old bills that are presented to it—half a billion dollars were exchanged last year—but the financial demand is such that many bills are kept in circulation long after they should have been destroyed. As for the subsidiary coin, large amounts are sent to the Treasury every year for redemption, but they are again distributed either by shipments to depositors therefor, or paid over the counter at treasury offices in exchange for other kinds of money. This coin should be cleansed and sterilized before it is redistributed. It should also undergo a process of disinfection at various stages during its period of service, on the part of banks, street railway companies, and other corporations that handle a large number of small coins. A Boston firm that made a specialty of catering for women made an arrangement with their bankers, by which they were generally enabled to give only clean or new money in exchange. But when they could not secure it, as was often the case during the holiday season, they caused all coins received to be dropped into a bath containing a germicide, and then had a girl take them out and polish them on a small machine, the process being shown on the first floor and attracting the most interested attention. The result has been an excellent advertisement for the firm, and department stores, factories, railways and other companies would find it profitable to follow this good example. All germs die when subjected to 300 degrees of heat; or a bath in a weak solution of carbolic acid or hydrogen peroxide would answer the purpose. As for the paper currency, the government should issue a much larger number of small bills, so as to meet the needs of circulation, and should also enable all holders of worn currency to exchange it for new, without charge for mailing and with a minimum of delay. It is gratifying to learn that the House Committee on Banking and Currency is investigating this subject, and it is to be hoped that prompt remedial measures will be taken. No government, it has been well said, can afford to have its currency a menace to the public health. The sanitary precautions which we take in so many other directions should be applied to "filthy lucre," as well.

An Assistant to the Engineer.

The recent approach to a fearful disaster on one of our largest railways, where a full passenger train was found—just in time—to be rushing into a busy terminal with a dead man at the throttle, has revived the discussion as to the importance of having two engineers on a train, especially on the lightning expresses. It is not fair, it is argued, either to the traveling public or to the engineer, to place the burden of protecting so many people on the shoulders of one man—a man who is expected to be on the *qui vive* for hours at a time, to signal at crossings every few minutes, and to respond to the constant demands made upon him by his position. It is well known that the engineers on our fast flyers can stand the strain for only a few years at a time before their nerve breaks and they are obliged to take charge of the slower branches of the service. And although, in the above cited instance, the fireman observed that the train was not running as usual, and was led to investigate the engineer's cab in time to avert a ghastly calamity, there have been many wrecks after which the engineer was found dead, and could give no explanation of his disregard of orders or of rules of the road. It is quite possible that he was already dead when the crisis arrived. In the case mentioned, he was killed by leaning out of the window and striking his head against a roadside obstacle. Others may have been disabled in the same way; or death may come through a number of other agencies. It should be noted, too, that some engines are so constructed that the engineer cannot be seen from the fireman's side—thus increasing the peril. There is already a tendency to lessen the responsibility for the engineer, by the use of automatic devices for signalling and breaking. But in view of the intense stress of modern railway travel, it would seem that railway managers should carefully consider the question of providing a companion for the engineer, so that an accident to him may not bring the dire consequences that are almost inevitable under the present system.

Wanted—A Steel Rail.

The man who can invent a method of making steel rails by the open hearth process will be rich sooner than the discoverer of a gold mine. There is a growing dissatisfaction with the rails turned out by the Bessemer method, and for some years there has been a demand for a different process of manufacture. The influence of the Bessemer converter upon modern civilization is beyond calculation. In a popular vote taken ten years ago, as to what invention introduced in the last half century had conferred the greatest benefit upon mankind, Bessemer steel was given the place of honor. As everybody knows, the air blast that passes through the converter producing the effect of a volcano in eruption burns the carbon out of the molten mass of iron. But this, as well as the speed of its operation, is now thought to be a drawback for

certain products. Railway men believe that rails with a larger proportion of carbon, and a smaller quantity of phosphorus, would be more durable. Some of the recent disastrous accidents have been attributed to the brittleness of the rails, and there is now a hitch in the negotiations between the steel manufacturers and the American Railway Association, because the former assert they cannot make the rail demanded by the latter. It is only a question of time when rails, as well as other products now turned out by the swift, frenzied converter, which blows iron into steel at the rate of four tons a minute, will be made by the slower and surer open-hearth process. William Kelly, whose place as pioneer in the American steel industry corresponds to that of Bessemer in England, always predicted that the open hearth furnace would triumph over its rapid competitor. Scientists in the Old and New World are working to this end, and the man who first succeeds in adapting the process to steel rails will never need to do another day's work.

The Science of Modern Warfare.

If the great war of the twentieth century—rumors of which are constantly coming from some part of the world—ever does occur, many new facts will be demonstrated. Not only are there new implements of fighting, but warfare itself will be found to be a very different thing from what it has been in past years. Mathematics has taken the place of daring in the new system of attack and defense, and mechanical science has replaced heroism. The man who leads his regiment in a dashing charge will be found to be as obsolete as the mailed knight of the days of chivalry. The glory has gone from warfare; it has become a matter of calculation and technical skill.

Especially is this true of the modern methods of coast defense. Automatic fortifications are being established along the frontiers of progressive countries, and Uncle Sam is spending \$50,000,000 in this manner. Experts believe these forts to be impregnable.

Within the fortification, there are observation points, at which range stations are located. In each are placed the instruments for sighting a ship of the enemy. One of these stations is the great nerve center of the system, communicating by electric lines with all the parts of the fort. Telephone systems, as well as telegraph, are being built along the entire coast, each station connected with a fortress. Coast guards are supplied with portable searchlights and telephones, the receiver clamped to the ear, so that they may be in constant touch with the officer in the controlling station.

There is little personal danger in the new system. The men fight in trenches so contrived that no shot can be fired at them which will hit them. The work of the observers in the different stations is to read the positions of the hostile vessels so as to ensure the accuracy of aim of the home guns. It should be understood that a gun is never fired directly at a moving ship.

It is fired at the spot where, it is calculated, the boat will be when the ball reaches its destination. The speed of the ship and the velocity of the shot must be allowed for. It would seem that this is a complex problem, involving too much time for the stress of battle; but in actual practice it has been found possible to locate a target six miles away, make the necessary calculations, aim and fire a gun, and drop a shot exactly on the specified spot, all within four minutes.

One of the most valuable of modern instruments in this line is what is called the flying periscope—a combination of telescope and camera, which will automatically take snapshots showing the details of everything visible on land and water within a radius of twenty miles.

The gunner seldom sees the ship he is firing at. He receives his orders and carries them out like the operator of an intricate machine. The success of the engagement, so far as the batteries are concerned, is determined before a gun is touched. All depends on the accuracy of the men in the range stations. The range and directions are read off, orders are telephoned, and an instant later the men at the guns turn the huge mechanisms to the proper angle and raise or lower them as required. At the appointed second, the guns are released, rise swiftly until their mouths are above the parapet, are instantly discharged, and sink back into place again through the force of recoil. The disappearing gun makes it practically impossible for an enemy to injure a fortress's weapons of offense, and as the electric wires of communication are buried, the hottest fire cannot isolate one part of a fort from another.

It will be seen that extraordinary power is thus placed in the hands of a single man. On his accuracy of observation the whole battle may turn. On the other hand, the element of personal bravery is eliminated, and with it the hope of fame and the halo of adventure that have always fostered the spirit of war. It remains to be seen what influence this factor will have in promoting peace.

Telephone for the Deaf.

According to the Swedish newspapers, the chief of the government telephone bureau has devised a miniature telephone, which is expected to be of great convenience to employees at the stations, and also to persons with defective hearing. In front of the membrane of this tiny telephone—which has dimensions of about half an inch each way—is screwed a cover with an elongation of hard rubber suitable to insert into the ear. When in use, this receiver is put into the auditory passage of the ear, and the connection consists of fine cord resting on or behind the ear in the same way as pencils or eyeglass cords are sometimes carried, and no helmet or extra fixtures are needed. It is believed that this miniature telephone can also be made useful to the deaf, who are usually better able to carry on a telephone conversation than an ordinary one. It is claimed that the microphone, nicely mounted, could be

carried in the shirt front, that the receiver can hardly be noticed when inserted in the ear, and that both can be connected to a dry-cell battery and an induction coil carried in the pocket. In case extra strengthening of the sound is needed, a receiver can be carried in each ear.

Rotative Steam Engine.

Remarkable claims are made for a steam engine invented in Spain. Our Consul at Barcelona says that the engine consumes only one fifth the coal per horsepower that ordinary engines consume, and occupies but one-fifth the space. An ordinary 100 horsepower engine weighs 15 tons; this one weighs but 3. It is claimed that the engine may be applied to all purposes for which steam power is required, whether on land or sea, and combines the essential working capacities of the ordinary steam engines now in use in which the piston with rectilinear motion is employed, including those which are the properties of the improved steam turbines. Patent rights have been applied for in the United States.

The Magnet in Industry.

A simple childish plaything has suggested an idea that will save the railroads of the country hundreds of thousands of dollars every year in wages, in repairs, and in time. Every school boy has played with a horseshoe magnet, picking up knife blades, needles, nails and any odd scraps of iron. Nowadays, instead of needles and nails, steel rails, wheels, castings, ingots, pig iron,—anything in which steel or iron appears—are lifted by a magnet, and carried to the place where it is wished to deposit them.

The loading and unloading of freight cars filled with iron and steel has always been one of the most difficult tasks connected with railroading. Large numbers of men have been required to do the work, and each piece had to be handled separately, with many unavoidable delays. If cranes were used for the heavier pieces, chains had to be adjusted; weights had to be balanced; and the loads had to be swung. It was a most inconvenient, tedious and expensive operation. The expense and inconvenience were not so important, but it took too much time. The object of modern transportation is to annihilate time, and the loading of iron by hand was clearly out of date.

The Pennsylvania freight yards in Jersey City are among the largest and busiest in the world. Every moment, night and day, a huge volume of freight pours into the yards to be distributed to the four points of the compass. Cars are handled there by the hundred thousand, and freight by the million tons. The managers grew impatient at the necessity of doing so much laborious hand work. Then some one suggested a magnet.

The device is a simple contrivance looking like a double crown of corrugated iron and steel, its two poles strongly marked, with its armatures concealed, and all suspended from the chains of a heavy crane. Around this

chain is wrapped the current wire, which gives the device life or takes it away.

It is an interesting sight to watch the unloading of cars by the new method. A big steel truck, piled high with rails, rolls within reach of the crane. The man in charge swings the magnet, allowing it to descend toward the load. He presses a button. The rails seem to thrill; like live things, they leap up to the magnet, ten tons of them at a time, clinging firmly, all in place and in orderly array. The crane hoists the whole; the rails swing clear almost without a rasp or sound, and just as noiselessly they fall into the waiting barge or on blocks. Nothing could be more simple or easy.

Or take scrap iron. The magnet dips its nose into a pile, and emerges looking like an alligator pear, with ten tons hanging to it. It does not take long to fill or empty a car at that rate. And there is no shouting or discussion or halting for rest; the magnet does its work quietly, tirelessly, and effectively.

At a recent test to determine the advantage over the old method of handling iron, six men were put to work unloading one car of wheels, while the magnet, which requires four men in its operation, went to work on another load precisely similar in size, material and weight. The magnet finished the job in an hour; the six men toiled half a day and were just through.

Other magnets have been ordered and soon all the handling of iron in this freight yard will be done by electricity. Magnets will do the work of hundreds of men, cut down expenses, and above all, save time.

The Lengthening of Railway Tracks.

The spreading and lengthening of rails and track on railways is a matter that has long troubled engineering circles. The tendency of steel rails to lengthen in the direction followed by passing trains is a disturbing factor in the conduct of double track roads, it being estimated that, aside from the element of danger, the cost of remedying this particular evil represents as much as a quarter of the annual expense of track repairs. The main causes of such lengthening are variously stated to be the thumping of the rolling stock against the rear ends of the rails, the friction of wheels under the stress of powerful brakes and weights, and the pressure of wheel flanges against the outer rail of curves. Single track roads are not similarly affected, since the passage of trains in both directions acts as a natural corrective of the trouble.

Through this forward motion of the rails, the safety space between rail ends disappears, and any increase in temperature is liable to result in the spreading or bulging of the track, as also the twisting and tipping of sleepers and ties, an effect especially noticeable and injurious near switches and frogs. At sharp grades and curves it may happen that one rail is moved forward while the other assumes the opposite motion, thus causing a dangerous twisting of the road bed.

In the past, the trouble was remedied to an extent by notching the iron rail for the reception of spikes that held

down the flange; but the tie also yielded to the pressure, and it was found that the rails were weakened, and frequently broke at places where they were notched. The expedient of applying the fish plates so as to keep the ends of the rails a fixed distance apart also proved unavailing, because the forward pressure was thus concentrated upon the two adjoining sleepers, which became loosened from their beds. Then an attempt was made to screw braces to the base flange of the rail, the ends of which rested against the spikes holding the rails, this was likewise found unsatisfactory, owing to the labor involved and the proportionate weakening of the rail, caused by the drilling of so many holes. Recently, however, an invention has been perfected which, it is claimed, solves the difficulty.

The apparatus consists of an iron clasp or clamp, the curled ends of which hug the base flanges of the steel rail from the top and firmly hold against the bottom of the rail a key or wedge of iron, the wide end of which is calculated to rest firmly against the side of the next adjoining sleeper. This wedge drives two pieces of iron against the slanting bottom of the clamp, thus automatically and successfully holding the entire apparatus in place by means of the very force that is sought to be counteracted. Through the application of a sufficient number of these clamps at points where the track appears particularly endangered, the entire roadbed is rendered steadfast, and the movement forward of rails has been successfully overcome.

Photographs by Wire.

The development of telautography, or telephotography, has already been noted in the INVENTIVE AGE (see the issue for May) but the latest is the discovery that it is possible to transmit photographs by ordinary telephone wires, and that almost as satisfactory results are secured on these wires as on lines specially constructed for the purpose. The only difficulty encountered on telephone wires results from calls on adjoining lines. These cause the formation of zigzag lines on the reproduced picture at the receiving station, but these can be corrected by retouching. Alterations in current intensity by ringing on or off, as well as conversations over adjoining wires, are without effect. It has also been shown that the wire employed for photographic reproduction can simultaneously be utilized for telephonic conversation.

The advantages accruing from this discovery, especially to newspaper men, are self-evident. In these days when so many newspapers have private wires or lease a wire to another city for a certain period, a correspondent can telephone his dispatches and at the same time transmit the desired illustrations. This invention, which had its birthplace in Europe, is being adopted there more rapidly than in America. A daily paper in Copenhagen, for instance, has ordered a complete installation for telephonic and telephotographic communication with its Berlin office. It will not be long, however, before it is adopted in our own country, and we can talk to a distant friend and see his photograph at the same time.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

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Bottle-stopper. I. B. Coy
Bottle-wrapper-making machine. J. N. Hahn
Bowling-ball. E. A. Schenck
Box-fastener. D. J. Fisher
Brake-lock. Wagon. L. Allenbrand
Brake mechanism. W. H. Douglas
Brake-rod adjuster. W. C. North
Brick and wall constructed thereof
Bridle-bit. E. D. Andrus
Brush. Fountain. F. Guedez
Brush. P. Rubco-Lisa
Brush. Shaving. M. Sheers
Buggy-seat. Adjustable. H. C. Ellsworth
Building construction. L. K. Davis
Burglar-alarm. N. L. B. Doull
Burglary. Device for alarm and detecting
Button-making machinery. N. Barry, Jr.
Buttonhole-stitching machine. E. B. Allen
Calipers, scale, and dividers. Combined
Camera focussing-hood. F. Buchhop et al
Camphor. Making. C. Glaser
Can-forming machine. C. B. McDonald
Candy. Making soft peanut. L. J. Green et al
Car bolster. Railway. J. O. Neikirk
Car door. Box. J. Simonton
Car-fender. S. Ishii
Car-fender. Street. G. A. Parmenter
Car grain-door. W. W. Decker
Car-heater. F. W. Lord
Car. Passenger. A. Lipschutz
Car. Railway. W. A. Crawford-Frost
Car side bearing. E. S. Woods (Reissue)
Car. Sleeping. H. R. Schmedes
Car-stake. F. L. Irwin
Car tank. F. L. Irwin
Car track-brake. Railway. W. Minc
Car-wheel brake. J. H. Shaw
Car-wheel fender. G. Gessert
Card and envelope. Shopping. H. Wittman
Carding-engine. M. Collins
Carpet-beater. C. S. Phocnix
Carriage feeding and controlling device
Cartridge. G. C. Blickensderfer
Cartridge. C. N. Dilatush
Cash-register. E. J. Von Pein
Cash-register, 2 pats. T. Carney
Cash-register, 2 pats. T. Carroll
Centrifugal machine. G. ter Meer
Centrifugal machine. H. B. E. Frost
Chafe-iron. H. B. Gale et al
Chain for doors. Safety. C. D. Rinald
Chair. W. E. Williams
Calk-holder. Tailors. N. Nadoolman
Change maker and register. J. F. Dredge
Change making, indicating, and registering machine. F. C. Osborn
Chime. H. Gibbs
Chimney-cowl. T. B. Samuel
Chuck. Drill. D. G. Morgan et al
Chuck for use on hammer rock-drills. Drill
Chute. Coal. A. L. Stephens et al
Cigarette-packing machine. E. T. Pollard et al
Clock. A. H. Hadley
Cloisonné designs. Making decorative
Clothes-drier. T. Pfister
Clothes-line holder. E. A. Thornton
Clover-huller stemmer. W. H. Fitzhugh et al
Clutch mechanism. Fluid. L. E. Snyder
Coal, ore, and the like. Machinery for handling. J. Campbell
Collar. Adjustable horse. W. O. Pierce
Collar-fastening means. W. A. Newby
Collar-shaping machines. Propelling-roller for
Combination-engine. W. H. Thompson, Jr.
Combination-lock. N. Tobias
Combining-machine. T. O'Connell
Combining-machine. E. H. Rooney
Combustion apparatus. Continuous. E. P. Noyes
Compass. Mariners. J. Kean
Concrete-block machine. G. W. Schock et al
Concrete curb and other structures. Metal nosing for. H. H. Wainwright
Concrete. Machine for mixing materials for. W. H. Peters
Condenser cleaner. Steam. C. Mild
Controlling mechanism. H. W. Cheney
Conveyor-grating. F. Brunotte
Conveying and mixing apparatus. L. K. Davis
Conveying and mixing machine. L. K. Davis
Cooking utensils. Heat-distributor for
Cooler. A. B. Cruickshank
Cooler. S. L. Joyner, Jr.
Cork-cutting machine. F. Schaumburg

Corn-huskers. Self-feeder for. O. C. Moore
Corn-husking machine. F. J. Fitzpatrick
Corn-picker. A. J. Brass
Cotton-chopper. B. C. Lancaster
Counting-machine. T. McTammany et al
Coupling device. W. J. King
Cranberry-separator. L. A. Hayden
Crusher. T. L. and T. J. Sturtevant
Cultivator and harrow. B. E. Huguley
Cultivator and thinner. Cotton. G. H. Power
Cultivator-beam attachment. W. H. Barham
Cultivator-guide. R. M. Jones
Culvert. Metallic. C. E. Wintode
Currents. Rectifying and interrupting alternating. O. Rothenstein
Curtain-fixture. S. F. Estell
Cutlery. Table. W. H. Smith
Cutter-head. Rotary, 2 pats. E. Haber
Cutting-machine receiver. A. Allen
Cutting mechanism. W. S. Luckett
Dam or dike construction for riprap. Wing
Dashboard-holder. D. Neale
Dehorner cutter or knife. Calif. C. Zoeller et al
Dental filling. J. Hood
Dental plugger. G. H. Shannon
Dial. H. C. Ingraham
Diamond-holder. E. C. Strong et al
Display-rack. R. Szczys
Distilling apparatus. H. A. Mackie
Door. J. A. Benisch
Door. Barn. S. Schooley
Door-lock. F. Muschenheim
Door. Rotary. J. F. Drucker
Doubling and twisting machine roll
Draft attachment for agricultural implements
Draft-equalizer. A. J. Peddy
Drawing instrument. J. Degen
Drying and counting mechanism
Drying frame. Thread. G. W. Swift, Jr.
Drill. J. Knott
Drip-pan. C. H. Phillips
Driving-box brass. E. C. Reiter
Driving-gear controller. C. Markel
Drum and cymbal beater. Combined
Dye and making same. R. Volkwein et al
Dye and making same. Sulfur
Dyeing establishments. Horse for. W. Herzberg et al
Egg-poaching pan. J. Knott
Electric cable and wire. Device for pulling
Electric reciprocating device. D. H. Garber
Electric resistance bodies. Production of
Electric switch. F. Bölling
Electric switch. J. J. Ross
Electric-wire conduits. Machine for making tubular. A. P. Hinksy
Electrical cut-out switch. W. H. Ringwood
End-gate. A. Roberts
Engine sparking plug. Gas. J. F. Thomas et al
Engine-testing device. Explosive. H. C. Estep
Engraving-machine. Pantographic. C. Kuehner
Excavating-machine. G. J. Miller
Exercising apparatus. R. E. Patterson
Explosive-engine. J. Palmer
Explosive-engine. J. J. Leary
Fan and turbine-engine. Centrifugal
Fan. Ceiling. L. J. Wing
Fan. Turbine. A. Rosenberg
Fatty matter. Manufacture of easily-emulsifiable. L. J. Wing
Feed-bag. E. Wörner
Feed-bag. K. H. Cressman
Feed-cutter attachment. L. E. Rice
Fence-post base. W. B. Woodruff
Fiber. Vegetable. B. S. Summers
Fibrous material. Retting or degumming
Filter. Water. C. R. Rogers
Fisking apparatus. J. S. Tollefson
Fire-escape. D. J. Kelly
Fire-escape. J. Bowen
Fire-escape. T. G. and J. E. Howes et al
Fire-escape. C. H. Redman
Fire-extinguisher. J. H. Bell
Firearm. J. M. Browning
Fireproofing device. O. Kahnweiler
Fishing-line caster. F. J. Bennett
Floor-finishing apparatus. N. D. S. K. Beck
Flour-bolting machine. M. C. and J. C. Landes
Fluid-gage. M. Martin (Reissue)
Fluid-pressure system. S. B. Stewart, Jr.
Folding rack. J. J. Ronan et al
Fruit-picker. E. Gier
Fuel. Manufacturing artificial. I. Foreman et al
Furnace attachment. J. R. Moler et al
Furnace-door frame. L. L. Knox
Furnaces. Water-cooled door for. L. L. Knox
Furniture and analogous structure. B. F. Hull
Game-trap. Automatic. M. Shelton
Garment-hanger. E. O. Fellroth
Garment-supporter. A. M. Ziegler
Garment-supporting clasp. J. F. Atwood
Gas-burner. B. L. Noyes
Gas-burner. G. S. Andrews
Gas burner. Oil. M. Dyer et al
Gas cut-off. Automatic. J. G. Fairbanks et al
Gas-engine. C. H. Morgan
Gas-furnace installation. H. Koppers
Gas-generators. Hood for discharge-pipes of
Gas machine. Acetylene. W. A. Wallace et al
Gasket. H. E. Grey
Gasoline-engine. L. Wottring
Gear. Power-transmitting. G. Talmage
Gear. Variable-speed and reversing
Gearing. Reversing and speech-changing
Gearing. Variable-speed. G. G. Talmage
Glass-working furnace. E. Fason et al
Grain-distributor. I. A. Milliron et al
Grain-drill. N. L. Heckman
Gramophone. A. L. Johnson
Grate. H. Schröder
Grate. W. Fitzgerald
Grease-cup. J. J. Aull

Grinder. Drill.....O. Lange
Grinding-mill and pulverizer.....J. W. Boileau
Grinding-mill lining.....J. R. Brown
Gun-barrels. Means for removing powder-gases from.....F. Bohn et al
Gun-elevating mechanism.....O. Lauber et al
Gun. Magazine.....J. M. Browning
Guns. Fluid-brake for recoil.....O. Lauber et al
Guns. Single-trigger mechanism for double-barrel.....M. D. Hogan
Hair-clipper.....W. Blair
Hair-pin.....B. H. Cook
Hammer. Magazine.....J. Hamilton, Jr.
Harrow.....F. P. Bowman
Harrow riding attachment.....L. E. Roby et al
Harvester and husker. Corn.....E. M. Harris et al
Harvester. Corn.....S. C. Anderson
Hat-pin guard.....A. Carlyle
Hay and grain rake, loader, and stacker.....W. Kouns
Head-rest.....H. H. Raymond
Headlight.....D. M. Toner
Headlight bracket. Electric.....C. E. Jones
Heater.....A. B. Ferdinand
Hinge.....E. E. Rice
Hinge.....A. G. Wilson
Hoist.....C. E. Sterne
Hoisting and conveying apparatus.....G. A. Fox et al
Hoisting-bucket.....C. S. Williamson
Holdback.....C. E. Moxley
Hollow articles. Mold for forming.....J. A. Williams
Hook.....F. E. De-Long
Hook.....J. A. Fonville
Hook and eye.....J. P. Baumgartner
Horn-like mass. Producing a.....H. Schwarzberg et al
Horseshoe-calk.....J. D. Kelleher
Hose-coupling.....R. M. Haley
Hosiery and making same.....R. W. Scott
Hosiery and manufacture of the same.....R. W. Scott
Hub. Wheel.....W. F. Jessup
Hydraulic pressure on power-houses and similar structures. Means for resisting lateral.....D. E. Moran et al
Hydrocarbon-burner.....I. F. Zimmerman
Ice-cream freezer.....T. J. Fegley
Ice-cream freezer can.....T. J. Fegley
Ice-cream spoon.....D. M. Mosteller
Index and balance indicator.....R. L. Angell
Index. Telephone.....J. B. Hale
Injector-burner.....J. A. Wiggs, Jr.
Ink-well.....J. B. Sciozzafava
Insect-trap and tree-guard.....A. E. Hinton
Insulating-conduit for electric wires.....A. P. Hinsky
Insulator-tie for electric wires.....J. W. and W. R. Beckett
Internal-combustion engine.....H. G. Wood
Iron structure.....E. B. Repp
Ironing-board. Folding.....J. C. Culbertson
Ironing-table.....W. S. Glover
Jar-opener.....E. F. Ives
Journal-bearing.....C. Skidmore
Journal-box and lid.....C. G. Hawley
Kinestoscopes. Independent device for.....J. A. Le Roy
Knitted web.....L. N. D. Williams
Knitting machine. Circular.....L. N. D. Williams et al
Knitting machines. Sinker-wheel for circular.....W. T. Barratt
Knockdown chair.....R. S. Calef
Ladder.....E. O. Green
Ladder and chair. Convertible step.....H. S. Wright
Ladder. Extension.....L. P. Reimann
Lamp adjuster. Electric.....W. S. Hawker
Lamp. Incandescent gas.....A. Rector
Lamp-receptacle, 2 pats.....H. W. Lawrence
Lamps. Lens-fastening for.....E. C. Everett
Lantern.....E. C. Everett
Lantern-guard.....E. C. Everett
Lantern. Tubular.....C. L. Betts
Last. Hinged.....E. O. Krentler
Lawn-trimmer. Edge.....B. A. Sahlmann et al
Lead-pulverizing apparatus. Metallic.....J. W. Bailey
Level.....J. W. Powell
Level-head.....A. C. Young
Leveling-rod. Surveyor's.....J. Oss
Linotype-machine.....J. R. Rogers
Liquid-dispensing apparatus.....F. R. Randall
Liquid-dispensing mechanism.....W. H. Walter
Liquids. Intermixer for miscible.....H. J. Coster et al
Litter-carrier. Gravity.....E. Jordan
Load-binder.....G. W. Leeper
Lock-hook.....R. D. Shawver
Lock mechanism. Time.....J. C. Mock
Loom picker-stick motion.....R. Taylor
Loom. Weft-replenishing.....H. Wyman
Looms. Thin-place detector for.....E. F. Allen
Mail-bag catcher.....L. Didier
Mail-pouch. Rural-delivery.....J. W. Altmyer
Manholes. Means for covering.....H. R. Brain
Mattress-frame.....F. G. Gale
Meat-holder.....L. Garm
Metal-melting.....S. Knight
Metal-sawing machine.....C. A. Juengst
Metal-tie transfer apparatus.....K. C. Gardner
Metallic tie.....C. M. Beehler
Micrometer-gage.....L. C. Woerner
Mile-register.....J. Alexander
Milk-generator.....A. O. Mitchell
Mills. Feed mechanism for tandem.....G. D. Evans
Mixing apparatus.....L. K. Davis
Mixing-machine.....T. B. Blixt
Molding-machine.....A. W. Rom
Mop head and wringer. Combined.....F. R. Shearman
Mower.....F. Kierzek
Musical-instrument attachment. String.....F. V. Skinnell
Nail-clenching tool.....E. A. Noblet
Nest. Egg-trapping hen's.....F. C. B. Hilkemeier
Nest. Poultry trap.....W. P. Bavnes
Nut. Expansive.....W. R. Miller
Oil-can. Pneumatic.....J. S. and E. L. Arnott
Oiling device.....L. D. Groesch
Ore-roasting furnace. Automatic.....W. F. Oesterle
Ore-treating apparatus.....J. C. Hames
Overshoe-clamp.....E. W. Waltz
Oyster-opening apparatus.....J. Jacobsen

Paddle and pick-pole. Combined.....W. Moriarty
Padioc.....C. E. Johnson
Padioc. Combination.....N. Tobias
Pail-earring machine.....P. W. Fulford et al
Pail or bucket. Sap.....J. Hall
Paper-bag machine.....C. F. Smith
Paper-clip.....J. L. Perkins
Paper-making machinery.....W. E. Ramage et al
Paste-holder.....O. Dreher
Peeling machine. Vegetable.....H. Robinson
Pencil-sharpener. Automatic.....L. Myers
Penholder and blotter. Combination.....R. S. A. von Pingel
Petroleum and other similar hydrocarbons.....F. J. Lothammer et al
Saponifying.....F. J. Lothammer et al
Phonograph. Magazine.....A. A. Pratt
Photographic films. Spool for.....J. W. Schatz
Photographic plates to be exposed in sections. Device to enable.....W. B. Henderson
Pile-cutter.....C. D. Day
Piling apparatus. Metal.....F. H. Beche
Piling box or tray.....C. H. Erickson
Pin.....H. P. Coulter
Pipe and cigar-holder.....E. L. Cook et al
Pipe and tube cleaner.....P. Kessler et al
Pipe-coupling.....L. V. Deloche
Pipe-coupling jack.....A. T. Herrick
Pivot-joint. Separable.....G. F. Richter
Planer. Bowling-alley.....J. M. Porter
Planer. Floor.....G. G. Rehfeld
Planing and matching machine.....S. Cline
Planter. Corn.....G. H. Field
Planter. Potato.....L. A. Aspinwall
Planters. Land-marker for corn.....W. W. Newberry
Plow. Wheel.....E. J. Ingram
Pneumatic engine.....E. D. Ackerman et al
Pocket-protector. Invisible.....B. Almy
Popping-machine.....N. B. Post
Post-driver.....W. T. Morris
Potato-digger.....W. J. Ellard
Pots, kettles, &c. Detachable handle for.....R. Hoffman et al
Powder charges. Envelop for.....C. Davis
Power in helical springs. Device for storing up.....M. Hermsdorf
Power-transmission mechanism.....C. R. Radcliffe
Pressure-roller.....W. Love
Printing-machine.....J. P. Cleal
Printing machine. Warp.....C. H. Landenberger
Projection apparatus.....E. W. Goodrich
Propeller.....J. H. Pierce
Propeller. Screw.....F. W. Ordng
Propelling mechanism. Boat.....W. T. Mooney
Pulley.....P. D. Skahan
Pulleys. Roughening-tool for belt.....F. Grill
Pulp-beater. Continuous.....G. D. Claffin, Jr.
Pulverizing-machine.....G. A. Bell
Pump and automatic pressure-regulator therefor.....G. Schmidt
Pump-equalizing device.....E. Arch
Pump-operating engine.....S. Lundquist
Punching and drawing machine. Combined.....A. Freier
Quilting-frame.....C. D. Kriebel
Rag or paper reducing machine.....J. L. Perkins et al
Rail-joint.....C. F. V. Hansen
Railroading. Electric.....I. Kitsec
Railway-rail and connection therefor.....E. Hamilton
Railway-rail fastening.....J. P. Lancaster
Railway safety appliance.....M. E. Hogan
Railway-switch.....J. D. Downes
Railway-tie.....H. O. Kelsey
Railway-tie. Metallic.....N. F. Arble
Range-finder.....B. A. Fiske
Razor-strop.....O. C. Morris et al
Razor-stropper.....A. H. Fleming
Receptacle. Metallic.....W. L. Fales
Recreation-wheel.....C. G. Hutchinson
Register.....S. J. Salter
Registering head. Adjustable rope-locking.....H. Behnfeldt
Registering mechanism.....W. Langrill
Registering mechanism.....C. Alexander
Rein-holder.....C. F. Mayer
Respirator.....E. N. Casey et al
Rice-huller.....J. W. Stokoe
Road-roller.....E. T. Wright et al
Road-scarifier.....E. T. Wright et al
Rocking and standard chair. Combined.....J. Honig
Rotary engine.....O. Ebert
Rotary engine.....J. T. Constandse et al
Rubber boot.....J. T. Crowley
Rubber stamps. Apparatus for making.....G. J. B. Rodwell
Rudder-controlling device.....F. Gardner
Sad-iron, 2 pats.....J. M. Harper
Sad-iron.....P. C. Greenwalt (Reissue)
Sad-iron folding device.....I. L. Duncan
Saddletree-horn.....L. L. Nelson et al
Safe-door recording device.....E. F. Abbott et al
Sand-blast apparatus.....W. H. Kelly
Scaffold. Bricklayer's.....A. J. Hensley
Scale. Weighing.....E. Sutherland
Scraper. Wheel.....C. W. Goodson
Scraping-machine. Manual.....H. W. Blaisdell
Screw adjustments. Locking device for.....J. M. Smith
Screw-holder for drivers.....T. J. Fegley et al
Seal. Bottle.....E. D. Schmitt
Seed-drill, 2 pats.....L. E. Roby
Seesaw.....J. G. Fouts
Separator.....E. H. De Lany
Sewing. Machine for preparing shoes for.....J. B. Hadaway
Sewing-machine thread-cutting device.....R. L. Lyons
Shades. Spring-lever for.....J. Tanner
Shaft. Flexible.....W. Douglas
Shaping-machine feeding mechanism.....K. Stockbridge
Shaving-cup, 2 pats.....G. H. Viacour
Sheet-metal can.....W. Haaker
Shingle-machine.....F. W. Burpee
Shirt attachment.....W. W. Worth
Shoe-fastener.....E. L. Knapp
Shoe-filler and making the same. Asbestos.....E. F. White
Shoe-tongue.....W. J. Smith
Sieative. Making a.....L. G. Laffer
Sight-feed lubricator.....P. Binder
Signal.....W. A. Richardson (Reissue)
Signaling apparatus for tramways.....J. M. H. Renson
Siphon-separator.....J. E. Nelson

Skate. Roller, 2 pats.....P. G. Pilz
Skate. Roller.....B. Domis
Skins, &c. Apparatus for treating.....W. R. Smith
Smelting-converters. Means for preventing escape of unfused ore from.....R. Baggeley et al
Smoke-preventing furnace.....A. W. Puddington
Smoker's pipe.....H. Jones
Speed-governing device.....N. E. Lemmon
Speed-indicator.....O. Junhans
Spool or bobbin.....E. Hubbard
Sprayer. Liquid.....L. A. Aspinwall
Sprayer. Liquid.....B. Jiroka
Sprinkler system.....O. T. Farnham
Sprinkler system. Automatic.....E. L. Thompson
Sprinkling machine. Keg.....O. L. R. Ritter
Stalk-cutter.....B. C. Lancaster
Stand.....H. C. Chamberlin
Steam-boiler.....L. W. S. Busler
Still.....A. D. Steens et al
Storage battery.....W. Gardiner
Stove.....W. A. Hammer
Stove. Cooking.....D. Buhlmann
Stove. Drying.....P. Ostertag
Stove fire-box. Cooking.....A. F. Harter
Stove-polisher. Fountain.....W. J. Nagely
Stove-pipe-holder.....W. Wyatt
Street-indicator.....H. M. Lambert
Structure. Composite.....A. De Man
Suspension-bracket. Catenary.....E. P. Morris
Suspension-bracket for curves. Catenary.....E. P. Morris
Switch.....E. L. Murphy
Switch-locking and operating mechanism therefor.....H. H. Nichols
Switch-operating device. Electric.....F. A. Johnson et al
Tack and staple extracting tool. Combined.....H. J. Behr
Tapping apparatus.....H. Hildenbrand
Target. Flying.....J. C. Jensen
Telegraphy. Space.....J. S. Stone
Telephone attachment.....A. S. Perry
Telephone-lines. Testing system for.....W. W. Dean
Telephone-receiver support.....J. S. Mills
Telephone repeater system.....N. G. Warth
Textile machinery. Unbreakable self-lubricating long collar for.....J. H. Brindle
Thermostat.....F. W. Robertshaw
Thill connection. Buggy.....C. T. Englund
Thread-holder.....C. Garvin
Ticket holder and cutter.....J. O. M. Seibert
Tickets to goods. Machine for attaching.....H. G. Davis
Time-alarm.....C. J. Emerson, Jr.
Time-recorder. Employee's.....A. A. Newman
Tire-mending implement.....J. W. Blodgett
Tires. Inserting plugs in pneumatic.....J. W. Blodgett
Tool. Combination.....H. W. Boltz
Tool. Combination.....S. J. Sibley
Tool. Pneumatic.....W. H. Van Sickle
Toy.....T. I. Temple
Toy train.....J. W. Bates
Trace-carrier.....O. T. Olson
Trace-holder.....S. E. Harsh
Transom trunion mechanism.....G. O. Smith
Trolley-guard.....C. Harkness
Trolley-harp.....F. H. Brueggeman
Trolley-harp.....T. W. Small
Trolley-wire hanger or ear.....H. G. Dyer
Truck and turn-table for ore-cars.....W. C. Matteson
Truck. Automobile.....T. Neville et al
Truck. Car.....W. G. Price
Tumbling-barrel.....H. J. Guttman
Tunneling-machine.....R. B. Sigafos
Turbine-engine.....H. Lentz
Turbine. Steam.....R. Schulz
Turpentine-cup and attachment.....J. J. Palmer
Twine-holder.....W. H. Reynolds
Type-setting machines. Apparatus for the electric operation of.....H. Drewell
Type-writing machine.....F. A. Young
Type-writing machine, 2 pats.....G. C. Blickensderfer
Type-writing machines. Line-spacer for.....J. S. Southerden
Typographic machine.....F. H. Richards
Umbrella. Folding.....J. W. Stimmell
Undergarment for infants.....C. R. Jackson
Valve. Combination relief and back-pressure.....W. Hochfeldt (Reissue)
Valve. Tank.....F. W. Robertshaw et al
Vaporizer.....C. R. Radcliffe
Vat-closure.....H. W. Blaisdell
Vault. Cement burial.....W. Gipe
Vehicle.....A. Schieppati et al
Vehicle-brake.....T. L. and T. J. Sturtevant (Reissue)
Vehicle driving-gear. Motor.....W. H. Douglas
Vehicle. Motor.....J. Forrest
Vehicles. Bonnet for motor.....J. Sherwin
Velocipedes or like vehicles. Adjustable handle-bar for.....A. Vernet
Vending-machine.....E. P. Garner
Vending-machine.....J. Fritsche
Vending-machine coin-wheel.....J. Fritsche
Ventilator.....H. Brastington
Vertical boiler.....T. Suzuki
Vibrator-connector.....L. B. Jenckes
Vibrator or massage instrument.....F. B. Fuchs
Vine-cutter.....S. Schertzer
Voting-machine.....E. B. Willix et al
Wagon-box.....E. Falkner
Wagon. Dumping.....J. Heberling
Wagon. Dumping.....B. A. Hill
Washing-machine.....J. A. Wolfley
Washing-machine.....G. R. Adams
Watch.....G. L. Mantaras
Watch-protector.....J. Fierz
Watch. Stem winding and setting.....A. Bannatyne
Water-closet.....C. H. Rollins
Water-closet.....J. H. Stevens
Water-closet bend.....B. Oakes (Reissue)
Water-closet floor-joint.....J. W. Crawford
Water-closet waste-pipe connection.....T. E. Flynn
Water elevating and discharge apparatus.....W. L. and J. H. Harper
Water-heater.....I. Watts
Water-heater. Portable.....R. W. Bowen
Water-meter.....W. G. Volz
Water-tube boiler.....R. C. Montague
Web folding and associating device.....W. Scott
Weighing apparatus.....J. Ertner et al

Weighing-machine.....E. Cameron
Welding clamp. Electric.....W. E. Williams
Well-bailing apparatus.....M. W. Carroll
Well-drilling machine.....J. R. Gruff et al
Well-strainer.....J. H. McEvoy
Wells. Making water-proof.....J. K. Reynolds
Wheel.....W. H. Douglas
Wheel-rim.....E. H. Kirsner
Whiffletree.....P. L. Vinsor
Window.....H. T. Atkinson
Window-screen. Metallic-framed.....S. W. Benson
Window-ventilator.....O. D. Lenz
Window-washing device.....W. G. Iluro
Windows. Pneumatic system for control of.....J. B. McKeown
Wire-coiling-machine reel.....G. B. Smith
Wrench.....L. D. Carter
Wrench.....L. J. Eyth
Wrench.....W. Bohr
Wrench.....E. R. Breckel
Wrench.....J. A. Losee
Wrench.....C. S. Vaughn
Wrench.....B. R. Beaver
Wringer.....H. T. White
Zinc-hlende by flotation. Separating.....A. J. F. de Bavy

DESIGNS.

Badge.....J. R. Kliez
Badge.....E. Bing
Chair, 2 pats.....I. H. Coffman
Clock-case.....C. G. Canivert
Dentist and barber chairs. Foot-rest for.....J. Barker
Emblem.....H. S. Walker
Inkstand.....C. H. Numan
Musical-instrument casing.....W. H. Pritchard
Padlock.....C. A. Erickson
Show-case.....L. K. Liggett
Stove. Heating, 2 pats.....A. K. Beckwith
Vehicle-body.....F. E. Eckhart
Vending-machine base.....C. C. Travis

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MECHANICAL PATENTS.

Account or ledger card in bookkeeping.....H. W. Templeton
Adding-machine.....C. P. and T. G. Moore
Advertising purposes. Mechanical device for.....S. and J. Chandler
Agglomerated body.....W. Schumacher
Agitator or mixing apparatus.....R. Smith
Air-brake apparatus.....W. T. Robinson et al
Air-brake appliance. Emergency.....H. W. Meigs
Alkali metals. Electrolytic production of earth.....G. O. Seward et al
Ambulance-stretcher and hospital-chair. Combined.....C. E. Bensinger et al
Atomizer, 2 pats.....F. C. Dormert
Auger for enlarging the lower ends of holes.....G. H. Miller
Automobiles. Spare-tire holder for.....L. P. McKinney
Awning.....M. Chalupsky
Axle-box. Combined spindle and vehicle wheel.....C. N. Waterhouse
Axle. Vehicle.....D. A. York et al
Bale-forming apparatus.....E. Reagan
Baling fibrous material and bale. Method of.....C. J. Luce
Baling-press.....J. King
Basement-pipe.....C. W. O'Neill
Basket-handle.....J. J. Sturm
Bath apparatus. Shower.....N. L. Wallen
Battery.....R. S. Clymer et al
Bearing. Ball.....W. M. Power
Beet-knife.....I. F. Sawyer
Beet dumping and screening apparatus.....L. T. Carson
Bell. Musical.....J. C. Deagan
Bell. Water-tight electric.....W. C. Hill
Belt-holder.....R. Braun
Billiard-cue tip. Detachable.....V. Ajello
Binding-post.....E. H. Rollinson
Bisulfite liquor. Tower for.....J. Bishop
Block-press.....J. C. Fowler
Blue-print-drying machine.....C. F. Pease
Board.....J. T. Ferres
Body-heater.....P. Stein
Boiler-cleaner.....J. W. Rietzke
Boiler tube or flue cleaner or scraper. Steam.....C. S. Dean
Bolt-cutting machine.....H. L. Fisher
Bolting machine. Flour.....T. W. Graham
Book-mark.....K. Erickson
Bookcase.....D. Mapes
Boot-bodies. Apparatus for making felted.....H. C. Richardson
Bottle. Non-refillable.....F. J. Davis
Bottle. Non-refillable.....O. Johnson
Bottle or jar closure. Milk and cream.....E. Braunfeldt
Bottle-washing machine.....B. E. Linfoot
Bottle-washing machine.....H. W. Van Leir
Box.....W. Straub
Box-blank machine.....E. Craig
Bracket.....L. Kahn et al
Brick-carrying vehicle.....J. J. Gledhill
Broom.....G. Brüstle
Broom-binder.....N. Dionne
Brush. Buffing and polishing.....E. N. Gaudron
Brush-holder.....R. Fehler et al
Brush. Wire.....J. Sallit
Bucket or conveyer.....W. F. Jones
Buffer.....A. P. Olson
Buffer. Friction.....J. Nichols
Builder's bracket.....A. H. Danforth
Building-blocks and artificial stone from plastic material. Apparatus for forming.....A. A. Pauly
Building construction.....R. R. Candec
Building-mold.....J. D. Bickford
Building structure.....H. S. Gardner
Burner.....A. G. Kaufman
Butter. Determining the percentage of water in.....G. E. Patrick
Buttonhole-stitching machine.....E. B. Allen
Camera-focusing device.....J. A. Dimock
Canning apparatus.....L. L. Lawrence
Canopy-bracket.....H. H. Bowland
Car dumping-cage. Mine.....G. Trotter
Car-fender.....C. Meyer
Car-fender.....H. M. Lambert

- Car-mover.....J. R. Doty
 Car-roof.....D. C. Ross
 Car safety appliance. Railway.....J. T. Andrew
 Car-seat. Auxiliary.....L. Joergensen
 Car-step. Pivoted.....R. M. Lamb
 Cars. Automatic electric gong-ringing device for street.....N. Rallek et al
 Cars, &c. Intermitting apparatus for cooling.....C. F. Edson
 Carbon-brushes. Means for attaching pigtails to.....M. W. Robertson
 Carbureter.....A. F. Rockwell
 Card-folder. Magazine.....C. C. McPhee
 Carding-machine feeder.....J. Stewart
 Carpet-sweeper.....C. J. Deitch et al
 Casein and producing same. Molding.....L. H. Barnett
 Cattle-guard.....V. A. Kelley
 Chair and crib. Combined.....A. B. Nielsen
 Charcoal-kiln.....C. D. Train
 Charging mechanism. Vertical.....C. L. Taylor
 Check-marking apparatus.....C. H. Marston et al
 Chimney-top.....E. P. Doty
 Chimney top or ventilator.....C. Saunders
 Churn.....J. L. Forbes
 Cigarettes having tobacco wrappers. Manufacture of.....G. P. Butler
 Cigars and all-tobacco cigarettes. Manufacturing.....G. P. Butler
 Cigarettes. Manufacture of.....W. H. Butler
 Circuit-closer. Automatic.....H. G. Pape
 Classifier.....S. L. Hague
 Closet.....C. E. Routh
 Closure for containing vessels.....J. Brenzinger
 Cloth-line fastener.....C. G. Thompson
 Clutch.....F. H. and J. D. Bachman
 Clutch for pencil-holders, &c.....A. A. Bowers
 Clutch mechanism.....B. M. W. Hanson
 Coffee-roaster. Automatic.....H. Mustonen et al
 Coil-winding tool.....J. L. Moore
 Coin-cup.....B. F. Tinsley
 Collar-fastening device. Adjustable.....F. H. Richards
 Combustion apparatus.....W. H. Ricker
 Composition or concrete post.....H. G. and J. W. Hays
 Compressor.....N. A. Christensen
 Computing-machine.....J. E. Carroll
 Concrete construction.....A. Pauly
 Concrete construction. Reinforced.....S. B. Zimmer
 Concrete structure. Reinforced.....E. R. Boyle et al
 Condensation-preventer.....E. O. Capen
 Condenser.....R. Schneider
 Condenser and centrifugal vacuum-pump. Jet.....B. Thoens
 Conveyer-stripper.....S. Moe
 Core. Collapsible.....W. C. State
 Cork-cutting machine.....H. F. Busch
 Corn-grader.....C. Hunnicutt
 Corset.....G. Berggren
 Coupling.....G. Bach
 Crane for carrying ladders.....C. L. Taylor
 Crate. Knockdown.....I. U. Minchert et al
 Crucible tapping arrangement.....L. Heynemann
 Culvert and bank-retainer. Road.....W. Isham et al
 Current-transformer.....O. de Faria
 Cutting-machine.....H. De Smith
 Dashboard-pocket.....C. E. Glynn
 Die-stock. Adjustable.....B. Border
 Dish-washing machine.....A. Insinger
 Disinfecting apparatus.....W. H. Rose
 Display-cover.....G. E. H. Richter
 Display-rack for metal bedsteads.....H. L. Powell
 Dividing-head.....L. Thiel
 Door. Combined storm and screen.....S. J. Spicer
 Door-hanger.....D. Doyen
 Door-operating mechanism. Double-sliding.....C. Metterhausen
 Doors. Means for hanging laterally-movable.....J. L. Kail
 Draft-equalizer.....J. H. Hardman
 Drill socket or chuck.....C. C. Roberts
 Drilling-machine.....E. Alshoben
 Drilling-machine multiple-drill attachment.....H. J. Jaquith
 Driving mechanism.....H. L. Johnston
 Dye. Azo, 2 pats.....M. Kahn et al
 Dynamometer.....F. Sellers
 Egg-desiccating apparatus.....J. M. Hussey
 Electric furnace.....W. G. Clark
 Electric generator.....K. Weman et al
 Electric motors. Connecting system for direct-current.....R. Brun
 Electric-wire clamp.....E. W. Bufinton
 Electrical and other devices. Receptacles for.....R. Siegfried
 Electrolysis. Multiple-needle holder for.....E. W. Johnson
 Elevated carrier.....W. Loudon
 Elevating and conveying mechanism.....A. R. Holmen
 Elevator.....C. R. Pratt
 Elevator-gate-operating mechanism.....J. E. W. Fogal
 Elevator signaling apparatus.....C. A. Reiners
 Elevator.....G. Gray
 Engine.....J. Schaeffers
 Engine lubricating means. Internal-combustion.....C. O. Hedstrom
 Engine starter. Explosive.....J. B. Bartholomew
 Engines. Air-supplying means for explosive.....A. Wagener
 Engines. Thermostatic regulator for explosive.....H. Charles
 Engineer's wrench.....M. Schwendner
 Etching.....E. Spitzer
 Explosive-engine.....A. E. Wolcott
 Explosive-engine.....H. Charles
 Explosive-engine.....E. J. Woolf
 Eyeglass nose-guard.....C. L. Howes
 Eyeglasses.....D. Woolf
 Fan-motor. Rotary.....W. C. Stevens
 Fastenings. Machine for inserting.....L. A. Casgrain
 Faucet.....A. Koerber, Jr., et al
 Faucet.....A. Ullmann
 Feeder. Boiler.....J. F. Senter
 Fertilizer-distributor.....D. M. Samuelson
 File. Newspaper.....B. McGinty
 Fire-escape.....S. P. Deeds
 Fire-escape alarm.....S. Ashford
 Firearm. Breech-loading.....W. H. Whittier
 Firearm safety-lock.....J. Tamhour
 Fireplace-heater for radiator systems.....W. G. Conkle
 Fireproof stud for plastered partitions. Sheet-metal.....C. H. Knapp
 Fireproofing cotton in bales.....H. V. Haley
 Floor-mat.....J. W. Horner
 Floor-scraper.....L. P. Thompson
 Fluid-actuating means.....R. Conrader
 Flush-tank.....O. F. Gildnen
 Fluting-machine.....R. F. Kunze
 Foot-warmer.....C. H. Whitaker
 Fruit. Apparatus for removing the skin from.....H. A. Beekhuis
 Fuel. Artificial.....L. Davis
 Furnace-casing.....C. Phelps
 Furnace-charging apparatus.....C. L. Taylor
 Furnaces. Charging blast.....A. G. McKee
 Fuse. Time.....H. Dahlke
 Gaff-clapper.....R. W. Wonson
 Garment-presser.....A. W. Eliason
 Gas-engine.....H. Pollard
 Gas or vapor by the direct application to it of a suitably-expanded medium. Method of and means for moving a.....W. H. Kenerson, et al
 Gassing yarns and other fibers. Burner for.....R. Rivett, et al
 Gear. Propeller.....W. Witt
 Gear. Reversible transmission.....W. S. Morton, et al
 Gear. Transmission, 2 pats.....A. J. Morse
 Gearing. Transmission, 2 pats.....A. J. Morse
 Gearing. Variable-speed, 2 pats.....J. S. Barnes
 Gin-saw cleaner.....M. Bradford
 Glass. Making prism.....F. L. O. Wadsworth
 Gluten. Obtaining dry.....L. A. Morel
 Governor.....E. F. Cassel
 Gramophone. Multiple.....A. T. Moore
 Grinding apparatus. Crank-shaft.....G. Benicke
 Grinding-machine.....J. S. Lucock
 Gun-cleaning tool.....A. H. Durston
 Gun cocking mechanism.....C. F. Lefever
 Gunnery-correcting device. Automatic.....E. W. Hubbard
 Gutter-insertion.....D. A. Sapp
 Halter and bridle. Combined.....D. H. Knight, et al
 Hammer. Power.....J. D. Kinson
 Handle-making machine.....M. O. Thompson
 Harness-pads. Manufacture of.....M. B. Lee et al
 Harrow riding attachment.....S. B. Hazard
 Hinge.....R. G. Winter
 Hinge. Gate.....J. V. Dunn
 Hinge. Spring.....A. F. Staples
 Hoist. Portable.....J. L. Pilling
 Hoisting device.....H. J. Schmick
 Hollow bodies. Apparatus for narrowing the wall of.....H. Kohl
 Horses of kicking. Device for breaking.....W. T. Neff
 Horseshoe attachment.....C. E. Mand
 Horticultural implement.....D. Craig
 Hose holder. Fire.....J. Kenlon
 Hose-nozzle.....H. M. Albee
 Hose-nozzle. Adjustable.....C. R. Ross
 Hub. Wheel.....W. J. Connolly
 Humidifier.....A. R. Clarkson
 Humidifying apparatus.....J. Taylor
 Hydraulic motor.....T. P. Bullard
 Hydrocarbon-engine.....E. Hudson
 Ice manufacture. Freezing-machine for.....D. L. Holden
 Indicator-gage.....H. A. Reynolds
 Ingot-manipulator.....J. Kennedy
 Ingot stripper and charger. Combined.....I. C. Cromwell, et al
 Internal-combustion engine.....C. Brizzolara
 Internal-combustion engine.....C. J. Mundhenk
 Internal-combustion motor.....B. L. Toquet
 Iron-refining material and preparing the same.....H. W. Lash
 Ironing-machine.....J. M. Lockhart
 Jar and drinking-fountain. Combined.....J. J. Droskey
 Jar-closure clamp.....J. Kunkel
 Journal-bearing.....F. E. Harden
 Journal-box lid.....A. Wissler
 Junction-box-cover rosette.....F. J. Russell
 Kinestoscope.....B. H. Keller
 Knife and other cutting blade.....G. Thuillier
 Knitted fabric.....B. T. Steber
 Labeling-machine, 2 pats.....W. Rüppich
 Ladder. Folding step.....F. B. Kones
 Lamp. Long-burning arc.....J. Rosemeyer, et al
 Lamp. Street.....J. Doyle
 Lantern burner. Signal.....F. A. Schuetz
 Last-block-sawing device.....H. J. Jaquith
 Latch. Car-door.....W. E. Lempp
 Lath-mill.....C. W. Willett
 Laundry device.....A. R. Wilson
 Leveling mechanism.....W. E. Martin
 Lightning-arrester.....W. J. Bell
 Linotype machine.....P. T. Dodge
 Liquids in receptacles. Apparatus for determining heights of.....G. M. Boone
 Lock.....W. H. F. Young
 Loom.....M. Perreault
 Loom. Cane.....W. Wattie
 Loom for weaving pile fabrics.....A. G. Cowell
 Loom harness-cvener mechanism.....B. F. McGuiness
 Loom shuttle-check.....P. Macpherson
 Loom. Swivel.....E. H. Ryon
 Loom. West-replenishing.....J. T. Cyr
 Lubricant feeding and distributing mechanism.....W. E. Parr
 Lubricating and dust-proof gland.....J. Robertson
 Lubricating apparatus. Steam.....W. Michalk
 Lubricating device.....H. C. Gamage
 Lubricating mechanism.....N. A. Christensen
 Lubricator.....H. A. Wehman
 Lubricator.....F. D. Winkley
 Lubricator.....W. Jamieson
 Lubricator.....J. Sherry
 Lung-testing device. Therapeutic.....F. W. Nebelthan
 Magnetic composition and making the same.....R. A. Hadfield
 Magnets of alternate-current generators. End connection for conductors on field.....M. Walker
 Mail-crane.....J. Bour
 Manure-spreader.....A. Johnston
 Matrices. Font of.....J. B. Bell
 Mattress-making machine.....J. T. Harris
 Measurements on fabric, piece goods, and the like. Apparatus for making.....E. Kessler
 Meat-chopper.....G. L. Forrest
 Memorandum-sheet. Dictation.....N. C. Duane
 Merchandise-holder.....D. F. Greenawalt
 Metal. Apparatus for electrically removing and severing.....R. E. Frickey
 Milking-machine and connections.....F. Raven
 Mine-haul.....F. W. Harris
 Miner's pan.....P. A. Harlick
 Mineral-separator.....R. J. McKone
 Minerals from ore. Apparatus for extracting.....O. A. Ellis
 Moistener. Label.....H. G. Campbell
 Molding-machine.....W. H. Wood
 Money. Instrument representing the transfer of.....M. H. Fox
 Mortar mixer or hoe.....N. Anderson
 Mower. Lawn.....E. Franke
 Mower. Lawn, 2 pats.....W. H. Coldwell
 Mowers and the like. Sickle-drive for.....C. A. Darrah
 Mowing-machine attachment.....H. M. Tarrant
 Nailing-machine work-gage.....L. A. Casgrain
 Nautical indicating device, 2 pats.....J. D. Stannard
 Numbering or marking machine.....G. H. Lang
 Nut-wrench.....W. H. Brawley
 Oil-can.....J. G. Woodward
 Oil-cup. Emergency.....R. T. Rickards
 Oiler. Automatic.....A. P. Ilson
 Ophthalmometer.....E. P. Brewer
 Ore-concentrating apparatus.....A. S. Elmore
 Ore-concentrating jig.....H. Foust
 Ores and separating by-products therefrom. Apparatus for roasting.....A. D. Lee
 Ores. Separating the metallic and rocky constituents of.....D. H. Norris
 Outlet or junction box. Universal.....J. L. Gleason
 Packing.....J. L. Sackett
 Padlock. Seal.....J. B. Orison, et al
 Paper-making and like machines. Electric drive for.....J. R. Happer
 Pen-wiper.....D. Scip
 Penholder attachment.....A. L. Hatfield
 Pencil attachment. Lead, 3 pats.....O. Mussinan
 Pencil-holder.....J. T. Haskins
 Photograph-printing machines. Time-switch for.....J. C. Calhoun
 Pickling vat or barrel.....E. Brockhoff
 Pincushion-stuffing machine.....E. S. Kidwell
 Pipe-hanger.....J. E. Jones
 Pipe-turning machine.....G. E. Foster
 Pipes, shafts, &c. Repair-clip for.....W. S. Palmer
 Planing-machine. Devices for automatically stopping a.....T. B. Rice, Jr.
 Planters. Seed-dropping mechanism for corn.....E. A. Johnston
 Plow. Wheeled.....I. A. Weaver
 Plowing-machine.....G. M. Clark
 Pole-base.....M. H. Murray
 Porcelain and other vitreous substances. Producing threads and undercuts on.....H. P. Osborn
 Power-transmission device.....C. D. Jenney
 Power-transmission device.....E. P. Warner
 Power yielding and receiving means.....F. W. Harris
 Preservative.....K. Rücker, et al
 Press.....M. S. Clark
 Printing-press.....A. G. Halpenny, et al
 Projectile. Explosive.....K. Voller
 Propeller for ships and boats. Reversible.....G. F. Villinger
 Pulp and paper. Manufacture of.....J. M. Dohan
 Pump.....A. Dellanna
 Pump. Automatic air.....E. J. Rohrbacher
 Pump-curb.....A. Schimmel
 Pump. Force.....W. K. Andrew
 Punch. Center.....L. W. Sherwood
 Puzzle.....O. M. Reed
 Radiator.....R. O. Stutman
 Radiator.....G. Mennesson
 Rail-brace.....L. W. Sprague
 Rail-joint.....C. C. Jantzen
 Rail-joint.....J. F. Bastel
 Railway.....H. L. Stillman
 Railway ballast handling and cleaning apparatus.....D. R. Mehaffey
 Railway block-signal system.....W. M. Chapman
 Railway block system and locomotive equipment for operating the same.....H. Longower
 Railway-crossing.....J. E. Reese
 Railway or like points. Mechanism for moving and locking.....L. D. G. Ferreira
 Railway-rail. Compound.....A. E. Smith
 Railway-rail tie.....J. Roberts, et al
 Railway-switch.....J. A. Coppock
 Railway-train system.....E. D. Small
 Raisin-seeders. Impaling-roll for.....E. L. Chadlock
 Ratchet-wheel click-spring.....E. H. Horn
 Receptacle. Expanded.....O. F. Eichberg
 Ripping tool. Garment.....A. S. Rosing
 Riving-machine.....M. Sternberg
 Roaster.....G. F. Knapp
 Rock-drill.....R. A. Fowden
 Rock-drill, 2 pats.....E. W. Evans
 Rolling sheet metal.....E. Norton
 Roof. Adjustable.....T. Wilson
 Rotary engine.....A. G. Edwards
 Rotary engine.....J. A. Mosher
 Rotary engine.....E. Mühl
 Rotary explosive-engine.....J. V. Ranck
 Rotary kiln.....W. R. Warren
 Router-head.....J. A. Pearson
 Routing-machine fixture.....H. A. Reynolds
 Rug-fastener.....E. Huntley
 Running-gear.....H. B. Studebaker
 Sad-iron handle.....W. G. Boughton
 Saddles. Manufacturing harness.....C. H. Grings
 Safety-hanger.....R. Arntsen
 Sash-fastener.....J. E. Gibbs
 Sash fastener and tightener.....N. S. Hillyard
 Sash-lock.....L. R. Eddy
 Saw. Chain.....R. L. Muir
 Saw filing and setting machine.....S. E. Arney
 Saw-jointer.....J. G. Murback
 Saw machine. Hack.....E. Renkenberger
 Saw-set.....T. W. Cross
 Saw-setting machine.....S. E. Arney
 Scissors.....J. Feinburg
 Scouring-wheel or the like.....C. A. L. Saunders
 Scraper.....L. G. Haase
 Screen sizing and separating machinery, 3 pats.....J. M. Callow
 Seal.....V. H. Huisig
 Sealing device. Bottle.....W. Bailey
 Search-light. Portable.....J. Dickens
 Seat.....H. G. Barrett
 Separating solid particles from each other. Apparatus for, 2 pats.....A. P. S. Macquisten
 Separating solids.....A. P. S. Macquisten
 Sewing-machine.....W. M. Ammerman
 Sewing-machine attachment.....G. I. Stevens
 Sewing-machine thread take-up.....W. Büscher
 Sewing-machines. Seam-trimmer throat-plate for.....H. L. Phelps
 Shade and curtain adjusting device.....R. A. Breitenfeld
 Shade and curtain-rod supporting bracket. Combined.....E. L. Brown
 Sheet-metal handle.....J. B. Wise
 Ship-salvage system.....A. B. Macklin
 Shirt-waist and skirt adjuster.....L. Barnett
 Shoe-fastening.....F. F. Dumke
 Shoe-polishing stand.....D. W. Craig
 Shoes. Manufacture of.....F. G. Delbon
 Shuttle. Automatic or self-threading.....R. L. Cumnock
 Side-delivery rake.....E. C. Smith
 Sign character.....H. V. D. Kelley
 Signal.....C. R. Dowler
 Signaling device. Electric.....A. Larsson
 Single-trigger mechanism.....W. H. Brown
 Skirt-gage. Dressmaker's.....J. Trauner
 Skirt-gage. Dressmaker's.....O. Kenney
 Slate-jig.....S. J. Kerrigan
 Sled. Self-propelled.....E. F. Bartlett
 Slicing-board.....F. J. Crique
 Smelting apparatus. Electric.....J. C. Young
 Smelting ore and converting matter.....A. M. Day
 Soap. Method and apparatus for placing inserts in cakes of.....W. Berry
 Sound-producing device.....J. P. Northey
 Spark-arrester.....R. Lamb
 Spark-plug.....G. W. Sage
 Speed transmission mechanism. Variable.....C. A. Janson
 Spike.....L. Dubé
 Spindles to shafts. Device for securing.....H. C. Gamage
 Spinning and ring-twisting frames. Ring-traveler for ring.....T. Demoulin
 Spinning machine. Ring.....A. Klein
 Spinning machine. Ring.....T. Yates
 Spraying fluid upon the surfaces of paper, textile fabrics, or the like.....C. A. Hanitzsch
 Spring-equalizer.....J. and A. Raab
 Square.....T. Sparks
 Stair-rail joint.....W. W. Burns
 Stamping-die.....J. R. Main
 Steam-generator.....C. R. Mosher
 Steam-trap.....A. Sorge, Jr.
 Step-switch.....C. Krümer
 Stereotype plate and base.....B. C. Schmitt
 Stoker for furnaces.....E. Bretney
 Stop-motion.....G. H. Lang
 Storage plant.....E. Meier
 Stove.....I. B. Sanders
 Stove. Gas.....W. H. Calkins
 Stovepipe-thimble.....C. T. McCarroll
 Strainer.....W. Jones
 Straw-binder.....H. A. Hancock
 Street-cleaner.....I. Ludlow
 Surgical or medical bandage.....P. F. W. Kappmeier
 Swinging screen.....J. H. Cornelson
 Switch mechanism. Automatic.....C. M. Bell, et al
 Switchback apparatus.....C. J. Hartley, et al
 Talking-machine sound-box.....E. R. Johnson
 Talking-machine. Mounting for the stylus-bar of.....L. F. Douglass
 Tank-alarm.....G. F. Elliott
 Telegraph-transmitter.....J. A. Carter, Jr.
 Telegraphy. Printing.....I. Kitsee
 Telephone-lines. Supervisory system for.....W. W. Dean
 Telephony.....D. M. Therrell
 Thermostat.....J. M. Harrison
 Thermostatic controller.....C. A. Dunham
 Threshing-machines. Self-feeder for.....A. Zastrow
 Tire casing or shoe. Pneumatic.....E. K. Baker, et al
 Tire. Cellular pneumatic.....E. C. Schoonmaker
 Tire setter. Rubber.....H. L. Stoup
 Tire. Vehicle.....G. O. Fankboner
 Tires to rims. Means for securing soft-tread, 2 pats.....F. M. J. S. and W. W. Hilton
 Tires. Tread for pneumatic.....E. K. Baker, et al
 Tobacco preparation. Masticable.....C. Ellis
 Tool. Pneumatic.....E. L. McCarthy
 Tool. Pneumatic.....F. S. Graham
 Tooth-crowns. Contouring gold.....F. La Chapelle
 Toy.....J. Heltzel
 Trace-hook.....H. Applegate
 Traction and lawn-rolling roller.....W. H. Coldwell
 Train-stop. Automatic.....H. G. Sedgwick
 Trolley.....L. S. Wilder
 Trolley-head.....J. D. Gibbs
 Trolley-pole. Jointed.....H. Padley
 Trolley-wire crossover.....D. H. Doak
 Trousers-stretcher.....W. T. Shoemaker
 Truck. Lifting and carrying.....T. C. Moore
 Trunk.....C. C. Wigington
 Tumbling-barrel.....H. J. Guttman
 Turbine.....J. H. Corthésy
 Turbine. Explosive.....H. Zorilly
 Turbine. Steam.....J. K. Clark
 Turn-table-operating mechanism, 2 pats.....J. L. Pilling
 Type-writer.....G. A. Aldrich
 Type-writer attachment.....J. I. Porter
 Type-writer feed mechanism.....F. Schüler
 Type-writing machine.....H. W. Merritt
 Type-writing machine.....C. Gabrielson
 Type-writing machine. Spool and ribbon mechanism for front-strike.....W. R. Fox
 Umbrella.....J. R. Shipman, et al
 Umbrella. Folding.....T. F. Bigelow
 Valve.....W. H. Roberts
 Valve for fluid-compressors. Discharge.....N. A. Christensen
 Vamp-holder.....J. U. Bergquist
 Vehicle-brake.....B. Viola
 Vehicle-rim.....L. B. and J. Gast, Jr.
 Vehicle-seat lock.....I. Arco-en
 Vehicle-spring.....G. W. Loeffler
 Vehicle storm-front.....O. A. Charles
 Vehicle-wheel.....I. Abbott
 Vehicle-wheel.....G. R. Williams
 Vehicle wind-shield.....W. N. Reicher
 Vending-machine.....H. A. Walters
 Vending-machine.....J. W. Giffatt, et al
 Vending-machine.....E. L. Sons, et al
 Vent-cap.....J. Capaldi
 Vessel. Marine.....T. S. Barwis
 Vessel-raising apparatus. Sunken.....F. Staud v Ximénez
 Vessels in case of collision. Protector for.....N. C. Yorgensen-Gunrhoim
 Vibrator.....R. C. Hill
 Voting-machine.....R. McKenzie

Wagon-brake. Automatic. J. T. Vanness, et al
Wagon. Dumping. F. Bloomingdale
Wagon. Dumping. A. C. Lemon
Wall and block for making the same
Wall block or section mold. Portable
Watch. H. B. Copeland
Water-governor. A. Bannatyne
Water-motor. W. J. Richards, et al
Water-motor. R. O. Hammond
Water trap. Waste. C. H. Moore
Well-drilling apparatus. Deep
Wheel. J. A. Jackson, et al
Wheel rim. Vehicle. E. D. Markham
Wheelbarrow-wheel. L. M. Padgett
Whip-socket lock. T. L. Smith, et al
Whisky-aging apparatus. B. H. Short
Windmill. W. J. Kickbush
Window. G. E. Humphries
Window. Metallic. W. E. Zahner
Window. Reversible. D. E. Hipolito
Window-ventilator. A. S. Meek
Windows. Weatherproof fitting for
Wire-feeding device. W. Nicol
Wire-locking device. Cross. W. P. Randall
Wire-stretcher. A. Heim
Wrench. L. A. Butts
Wrench. M. Schwendner
Writing apparatus. E. E. Scales
Writing-machine. C. J. F. Lange
Wurtzite or elaterite and producing fusible
soluble products. Trating
Yoke attachment for taking up vibrations.
Neck. L. Fields

DESIGNS.

Car-body, 2 pats. W. R. McKee, Jr.
Lightning-arrester casing and support
Picture-frame. F. W. Lord
Plate. H. T. Wilhelm, et al
Spoon. C. C. Selkirk
Spoons, forks, or similar articles. Handle for
Wall-pocket or similar article. H. Hillbom
Advertising apparatus. E. Flanagan
Advertising-machine. Rotary. H. T. Colc
Aeroplane. D. L. Moorhead

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MECHANICAL PATENTS.

Air-brake hose-coupling. E. W. Shaw
Air-compressor. G. C. McFarlane
Air-compressors. Control of electrically-driven,
2 pats. E. Hill
Air-compressors. Means for unloading. E. Hill
Air-ship. W. S. Mielcarek
Amusement apparatus. Portable
Asbestos covering and plaster to a hot-air duct
or pipe. Device for securing an. G. Pullets
Automobile. E. Hyslin
Automobiles. Compressed-air motor for
Awning. Roller. F. G. Herrington
Axle-lubricator. E. T. Toussaint
Bacteria. Growing and distributing nitro-
gathering. G. H. Eap-Thomas
Badger, Campaign. A. Jacobsen
Bag-holder. C. G. Carlson
Bait. Artificial. D. W. Brown
Bait. Artificial fish. J. D. Credlebaugh
Balance. Jolly. W. A. and J. C. Moore
Balers. Self-feeder for. G. Schubert
Band-cutter and feeder. C. Christiansen
Bearing. Roller. H. W. Alden
Bearing. Roller. S. S. Eveland
Bed-bottom fabric. Wire. H. Richardson
Beet-topper. A. Gudmunson
Belt-shifter. R. Wentsch
Billiard-table. Convertible pocket-carom
Binders. Cord-holder for self.
Bleaching-powder chamber. B. R. Benjamin
Blind-operating device. Window. M. Mauran
Block-signal. D. F. Loneran
Boring cylinder. Apparatus for. G. H. Ward
Boring device. Cylinder. D. H. Rowe
Boring machine. Post-hole. L. J. Van Kirk
Bottle. E. H. Campbell
Bottle and the like. A. Walters, et al
Bottle attachment. G. T. Trommald
Bottle-filling machine. K. Kiefer
Bottle. Non-refillable. J. M. Kirker
Bottle. Non-refillable. E. R. Ramsden
Bottle-stopper. P. H. A. Ieder, et al
Bottle-stopper. M. Linker
Bottles and the like. Holder for coffee.
J. H. Janssen
Box-making machine. W. Robinson
Box-shaping machine. Veneer. S. E. Wrenn, et al
Bridge. Draw. G. A. Wieland
Brush. Fountain. H. A. Bierley
Brush. Polishing. F. P. Chapoy
Buggy-body extension and rear-seat attach-
ment. W. J. Foster
Building-block. Waterproof. H. Noack, et al
Burner. S. A. Willson
Butter-cutter. R. F. Stewart
Button. A. J. Schneider
Calculating-machine. B. F. Stump
Calendar and holder therefor. T. H. Cox
Car brake. Mine. S. R. Green
Car-door mechanisms. Safety-clutch for.
C. A. Lindström
Car-door-operating mechanism. Safety-clutch
for. C. A. Lindström
Car end construction. Railway. A. Becker
Car. Grain. C. Rago
Car-hauling device. R. Ardell
Car-mover. M. N. Shell
Car. Passenger street. W. S. Twining
Car. Railway. H. S. Bayer
Car. Railway. A. Becker
Car-repairing device. H. E. Lind
Car-roof. J. I. Tatum
Car-stake. J. W. Stokoe
Car. Steel railway. W. F. Kiesel, Jr.
Car-underframe, 4 pats. J. S. Andrews

Car-window. W. F. Kiesel, Jr.
Carburetor. W. R. Park
Carburetor. A. C. Stewart
Carburetor. G. D. Garland
Card. Tally. E. D. McKenna
Carpet-holding spring. Vehicle
Carriage. Sick and invalid. P. Mullenmeister
Carton-blank-forming machine. F. M. Peters
Cartridge, 3 pats. C. A. Bailey
Cash-register. T. N. Weller
Casing-head. T. S. Cranston
Castings. Producing. G. H. Brabrook
Catch for pivoted closures. Safety-
Chain-tightener. J. W. Watkins
Chair having adjustable back. S. Risley, et al
Channel-flap layer. Portable power
Channeling-machine. W. H. Hooper
Cheese-press. C. P. Stanbon
Chimney. J. V. Sokup
Churn. T. Flynn
Churn and butter-worker. Combined. A. Jensen
Cigar-lighter. C. D. Vaughn
Clamping device. W. E. Wood
Clasp. A. Schuch
Clevis. G. W. Barnett
Clock. Program. D. H. Leas
Clothes-line support. J. Lynch
Clutch. E. F. Wright
Clutch device. T. L. and T. J. Sturtevant
Clutch for automobiles. Driving
Clutch for door-operating mechanisms. Safety-
Clutch. C. A. Lindström
Coal, ore, &c. Machinery for handling
Cock. C. C. King
Cock. L. C. Lewis
Cock. Gage. J. G. Saxe
Coffee-pot. B. Georg
Collar pad. Flexible horse. J. H. Taylor
Collar-stuffing machine. Horse. L. J. Powers
Composing-machines with two or more maga-
zines placed one above the other. Releasing
device for the matrices in. C. A. Albrecht
Compress. S. I. Webb
Concrete beam. F. Barré
Concrete-block machine. F. D. Merchant
Concrete-block-making machine. W. G. Tower
Concrete construction. Reinforced
Concrete structure. Reinforced. G. M. Graham
Controlling device. H. F. Cohl
Converter. A. E. Handy
Conveyer. R. Baggaley
Conveyer. J. D. Travis
Conveyer. G. C. Horst
Conveyer and elevator. J. H. Weston
Conveying apparatus, 2 pats. A. and J. M. Hall
Cooker and processor. Agitating. J. Jennings
Cord-adjuster. G. A. Robinson
Core-support and bearing member
Corn-drying shaft. U. Uhlhorn, Jr.
Corset. A. Assorati
Corset-waist. M. W. Lavy
Cot. Child's folding. F. A. Wildason
Cotton-chopper. W. A. Stockton
Crackers and the like. Machine for cutting
Crate. P. S. Ward
Crate. E. F. Hulbert
Cream-cooler. M. A. Muncy
Culinary utensil. W. and H. Kuehnlein
Culverts, conduits, and similar hollow struc-
tures. Mold for making. I. Hickson
Curette. H. E. Currey
Current generator and motor. Alternate-
Curtain-stretcher. A. Heyland
Curtain-stretcher. P. O. Holmquist
Curtain-stretcher. E. R. Orkin
Curtain-suspending device. Window
Cushion-tire wheel. A. A. Page
Cutting-tool. C. A. Marien
Cycles. Two-speed gear for motor. E. W. Ladd
D-handle. T. W. Wright
Dental clamp. H. B. Weagant
Dental fillings and the like. Apparatus for
making molds for the casting of
Desk-lid support. R. E. Decks, et al
Display cases. Extension-bracket for garmet-
Display means for doors or the like
Display rack. Collapsible. F. L. Williams
Display-machine. Collapsible. M. Mayer
Ditching-machine. G. C. Griffin
Ditching-machine. J. B. Hill
Draft attachment. J. J. Magin, et al
Draft-equalizer. O. M. Fisher
Draft-equalizer. G. P. Sampson
Draft-equalizer. L. F. Doron
Drains, traps, &c. Clamp for. W. J. Taylor
Drumheading-machine. M. Mairan
Dust-laying composition. Road. C. Ellis
Dust-pan. C. W. Jackson
Dust-suction apparatus worked by means of an
electromotor. Portable. A. Heine
Dye and making same. Red-orange monazo
Dynamo or the like. W. Herzberg, et al
Eaves-trough hanger. C. A. Vandervell, et al
Elastic and plastic substances. Production of
Electric contact-rail. E. W. Farnham
Electric-motor controller. C. S. Lee
Electric-motor-controller attachment
Electric motors. Method and means for con-
trolling. W. H. Powell
Electric motors. Method of and means for
controlling. L. E. Bogen
Electric regulator. F. C. Newell
Electric switch. E. M. Hewlett, et al
Electric time-switch. W. D. Ross
Electric wiring. Break-arm for. W. A. Arthur
Electrical accumulator. J. Knobloch
Electrical-distribution system. J. B. Fntz
Electrical purposes. Coil for. E. W. Todrey
Electrodes and heating by electricity and com-
bustion. Baking carbon. E. F. Price
Electrotype-locking apparatus. I. I. Floyd
Elevated carrier. W. Loudon
Elevator-bucket. I. O. Robbins
Elevator-shaft closure and operating means
therefor. S. E. Austin
Embroidery. Manufacturing. H. Häberer
Engines. Antislipping device for traction.
I. N. Mitchell

Engines. Ignition system for explosion-
Engines with explosive mixture. Apparatus for
supplying explosive. C. G. Dean
Eraser-holder. M. F. Creahan
Etching plates. Process and apparatus for
Evening. Four-horse. R. C. and H. R. Harris
Excavating-wheel. F. N. Griffin
Eye-shade. F. O. Ellis
Fan. Centrifugal. W. E. Allington
Faucet. W. H. Swift
Faucet. W. S. Cooper
Feed-roll. G. W. Drew
Feed-water heater. G. Curran
Feed-water heater for steam-boilers. Direct-
contact. G. Wilkinson
Feeder. Pigeon. J. R. Elliott
Fibers. Machine for working or dressing
textile. A. Mellor, et al
Films. Making nickel. T. A. Edison
Films or flakes. Making metallic. T. A. Edison
Filter. Pressure. J. H. Fox
Filtering apparatus. Slimes. D. I. Kelly, et al
Fire-escape. E. R. Morgan, et al
Fire-extinguisher. Automatic
Fire-shutter. J. A. and H. D. Loeb, et al
Firearm. Take-down. R. R. Reed
Firearm. Take-down. F. C. Shadwick
Firearms. Cleaning-rod for rifled. T. M. Price
Fireplace and chimney. U. Z. Keeney
Fireproof lath. W. Meier
Fireproof window frame sash
Fishing-ree. P. W. Frenzel
Flanging-machine. F. Schreidt
Flat-iron cover. C. W. Sleeper
Flue-cleaner. A. Deegan
Flushing-tank. A. Müller
Foot-supporter. W. McCormick, et al
Fork, egg-beater, and dish-lifter. Combined
Foundry-molds. Machine for making
Fringe-brushing machine. G. P. Mehaffey
Fruit-gathering device. H. S. Wilcox
Fuel. M. J. Sheahan
Fuel. T. Parker
Fuel for heating purposes. Supplying
Funnel. W. T. Kelley, et al
Furnace air-feeding mechanism. W. E. Cole
Furnaces. Fuel-feeding device for
Fuse-plug. F. Pallenberg
Game apparatus. R. C. Cole
Game appliance or puzzle. H. B. McCulloch
Garment-hook. T. M. Webb, et al
Garment-hook. W. H. Clay
Garment-supporter. K. Conry
Garment-supporters. Friction-slide for
Gas-engine. A. Abizaid
Gas-engine. J. W. Burkett
Gas-engine. E. Moore
Gas from peat. Obtaining. J. E. Smith
Gas-holder. G. E. Crosby
Gas. Making and utilizing. A. L. J. Queneau
Gas. Manufacture of illuminating and heating
Gas-meter. G. W. Ziegler
Gas-producer. B. H. Spangenberg
Gas-producer. M. V. Smith
Gas-producers. Poker mechanism for
Gate. S. B. Sheldon
Gate. E. L. Harper
Gate. A. J. Laurent
Gate. B. S. Edwards
Gear. Friction draft. J. J. Hoffman
Gear-shifting device, 2 pats. J. M. Crafts
Gearing. Yieldable. T. H. Gannon
Girder and column. Building. G. M. Graham
Glass lifter. Plate. O. N. Staley
Glass surfaces. Compound for treating
Globe-fastener. R. Hogan
Grain shock or sheaf leader
Grapple for boring-tubes. D. A. J. F., and R. C. Stewart
Grapple for boring-tubes. J. Bieffait
Grate. W. McClave
Grater. R. J. Clark, Jr.
Grinder. Disk. W. Browner, et al
Grinding apparatus. G. E. Norris, et al
Grinding carding-cylinder. Means for
Grinding-disk-truing apparatus. J. A. Stansbury
Hammer. A. K. Harford
Hammer. Power. P. S. Macgowan
Hammers. Nut and bolt turning attachment
for pneumatic. C. Wilson
Harrow. E. I. Cudaback
Harvester and shocker. Combined corn
Harvesting machine. Corn. G. T. Patten
Harvesting machine. Corn. G. S. Coffman
Hay-protector. N. and J. L. Brown
Hay-carrier. J. S. Mills
Hay-carrier. H. L. Ferris
Heating device. A. A. Radtke
Heating system. F. A. Simonds
Heating systems. Automatic regulator for hot-
water. A. Catepole
Hinge. S. R. Hewitt
Hinge. Door. C. Keith, et al
Hitch. Curb safety. A. Boyd
Hoe. Adjustable. J. E. Davis
Horseshoe. M. A. Liebert
Horseshoe. A. D. Ward
Horseshoe-pad. J. B. McArdle
Hydraulic motor. F. W. O'Brien
Igniter. Self. R. E. Berthold
Igniter system. R. Varley
Induction-motor. C. P. Steinmetz
Ink-well. C. Jackson
Insect-catching tape. Receptacle for
Insulating-coupling. S. V. Kay
Insulating-machine. G. F. Dreher
Insulating-machine. H. D. Saylor
Insulating material and producing the same
Insulator. C. L. Norton
Invalid-chair. Folding. R. E. Henderson et al
Ironing fold-collars. Machine for. L. R. Heim
Ironing-machine. W. Bartholomew
Ironing-table. G. Foster
Jack and restoring-drop. Combined
Jewel setter. E. J. Grenier
Joint-mold. L. H. Miller
Joint-mold. T. Hogan
Journal-bearing. F. H. Howard
Key guard and stop. H. M. Benedict
Knitted web. Open-work. R. W. Scott
Knockdown box. L. E. Reynolds

Ladder. F. S. Seagave
Lamp. Candle. J. A. Schuetz
Lamp. Fluorescent electric. J. A. Lallson
Lamps. Automatic suspending-rod for electric
incandescent. J. H. Gordon
Lampblack-making apparatus. J. L. Mann
Lantern-slide-moving device. Automatic
Lap-link. W. Frederick
Last-lock. A. Long
Lasting-machine. E. O. Kientler
Latch. Gate. C. F. Pym
Latch. Gate. H. F. Harist
Lath. Wood-column-turning. A. A. Adams
Lathe. Wood-column-turning. H. Bible
Leather preserving and finishing compound
Lenses. Making bifocal. T. P. Garrett
Letter-box. House. F. Dieckmann
Level and plumb. Combined. J. N. Walker
Lighting device. Automatic. I. M. Rose
Lime sucrate. Apparatus for making
Lock. E. Morrison
Locomotive ash-pan. P. Müller
Locomotives. Draft or work indicating and re-
cording mechanism for. S. T. Park
Log-guide for log-skids. A. Fromherz
Logotypes. Machine for composing and cast-
ing. J. Wicks
Loom. J. L. Polk
Loom picker-stick. E. Chexrette
Loom shuttle-box-or-crating mechanism
Looms. Bobbin-feeding device for weft-replen-
ishing. J. Gabler et al
Luggage-carrier and stand. Combined
Machine-brake. W. G. Schaeffer
Magnet coil. Self-sustaining field-
Mail-carrier's box. Rural. E. F. Hutchins et al
Mail-delivery apparatus. C. E. Gladding
Mantel. Cabinet. M. Marcks
Match-machine. W. F. Hutchinson
Mattress. W. F. Groskopf
Measuring apparatus. D. Berenberg
Measuring heights of persons. Device for
Mechanical movement. W. H. Johnson
Metal from deposits. Separating. J. H. Stanfield
Metal-melting furnace. J. V. Martin
Metal reinforce constructions. Filing for
Milking machine and apparatus. G. M. Graham
Miner's lock. S. Breite
Miner's lock. C. E. Miller et al
Mitering-machine. Angle-gage for
Mixing apparatus. W. R. Fox et al
Mixing apparatus. C. T. Drake
Mixing apparatus. T. J. Brockway
Monument. P. E. Mael
Motor-control system, 8 pats. W. H. Powell
Motor-control system, 2 pats. W. J. Richards
Mowing-machine tedder attachment
Mowing machines. Conveyor for lawn.
Music-leaf turner. J. H. Auhle
Music-roll and support therefor. F. S. Votey
Nickel ores or other material containing nickel.
Apparatus for treating with carbonic oxid
Nitrous compounds. Production of
Nut-lock. C. P. Steinmetz
Oil-burner. M. Moore
Oil-burner. S. T. Johnson et al
Oil burner. Crude. N. and C. Arch
Oil-press frame. A. Austerlitz
Ore-concentrator. P. Brophy
Ores. Sintering, 2 pats. J. Scott
Organs. Multipressure bellows for pipe-
Orienting device. P. Wirsching
Orienting device. E. von Bomsdorff
Oven or stove. G. Magnasco
Oyster-carrier. F. M. Filledge
Parking-ring. Piston. J. Kritzler
Paint-can. R. Weiss
Paper-bag-making machine. O. Hesser
Paper-cutting machine. E. Z. Taylor
Paper packages. Supporting device for toilet-
Peanut-stemming machine. A. H. Scott
Pencil-clasp. J. W. Steel et al
Pencil-clasp. F. A. Schneider
Phonograph. L. Devineau
Phonograph-reproducer. W. Schubert
Photographic measurements. Background for
Photographic-printing device. Automatic
Piano-action rail-support. A. R. and W. C. Palmer et al
Piano. Automatic. W. C. Vogel et al
Pianos. Automatic pedal-exposing device for
player. T. M. Pletcher
Pickling. J. F. Knahe, Jr.
Picture apparatus. Motion. M. Hensheim et al
Pipe-cleaner. C. F. Jenkins
Pipe-cleaner. C. Walker
Pipe-cleaner. C. D. Brown
Pipe-coupling and applying same. D. M. Kenvon
Pipe-coupling implement. D. M. Kenvon
Pipe or tube coiling means. R. R. Row
Pipe-wrench. G. C. Winslow
Plane. Bench. G. H. Bartlett
Planter. Bench. B. M. Graves et al
Planter check-row attachment. Corn.
Planter. Potato. E. J. Richmond
Plow. Gang. N. Waring
Plow. Gang. A. Thomson et al
Plow safety riding attachment. C. W. Fekberg
Pushing-machine. D. F. Auburn
Portable house. J. D. Horton
Potato-diggers. Vine-separating mechanism for
Potato-diggers. Vine-separator for
Power. Apparatus for the generation of
Power-transmitting mechanism. Clutch-device
Printing form and making the same. Litho-
graphic. G. G. Murray
Printing-machine. Platen. M. G. Rockstroh
Printing-press. I. A. Smith
Printing-presses and similar machines. Deliv-
ery mechanism for. G. W. Prouty
Propeller. P. A. Douse
Protractor. W. L. F. Keuffel
Pump. Automatically-balanced vertical-shaft
centrifugal. A. W. Hunsaker
Pump. Centrifugal high-pressure. C. Lager

Pump-head.....W. and H. M. Williams
 Pump. Oil.....G. Arrosmith
 Punching-machine.....S. C. Bond
 Quilting-frame and ironing-board. Combined.....M. M. Lowry
 Rail-joint.....A. Doratella
 Rail-joint.....J. P. Rodgers
 Rails or ties. Means for securing.....F. Weckerly
 Railway controlling system.....M. Trautmann
 Railway-rail.....W. T. Farley
 Railway-signal.....B. W. Rowe
 Railway signaling device. Electric.....E. B. Howell
 Railway-switch and automatic signal apparatus.....T. Wolfe
 Railway-tie.....W. T. Brister
 Railway-track liner.....G. A. Dugger
 Range-boiler.....V. Wilhelmi
 Razor. Safety.....F. H. Arnold et al
 Razor-strop.....G. P. Hensley
 Razor-strop attachment.....W. A. Breed
 Reamer. Expandable.....O. Lange
 Reel and display device for veils, laces, and like fabrics.....J. and A. Winchburgh et al
 Refrigerator.....W. Landry
 Refrigerator.....H. J. Shannen
 Refuse disposal. System of.....A. N. Pierson
 Ridge-bar. Ventilated.....A. W. Zilly
 Roaster-alarm. Automatic.....F. A. Hines
 Rotary engine.....S. S. Sadorus
 Rotary engine.....R. H. and W. L. Hebering
 Rotary engine.....W. F. Blecker
 Rotary engine.....J. E. Harriman, Jr.
 Rule. Multifunction-curve.....G. M. Healey
 Saddle.....C. Szameitat
 Saddles. Bucking-roll for riding.....J. A. Duncan
 Safe.....R. Lynn
 Safety-pin. Lock.....J. H. Lippe et al
 Salts. Electrolysis of fused.....F. von Kugelgen et al
 Sanitary bar.....W. G. Clark
 Sash for windows. Storm.....D. Todd
 Sash-lock.....J. Diehl
 Sash. Sheet-metal window.....J. W. Watkins
 Saw.....J. M. Allison
 Saw-guide.....B. A. Wadsworth
 Sawdust-blower.....G. T. Kerins et al
 Scaffold or trestle.....G. Bonenberger
 Scale.....E. Gazley
 Sealing-machine.....C. F. Davis
 Seam-dampener.....A. M. Torrance
 Seed-testing apparatus.....W. H. Kissel
 Separating-machine.....F. Stringham
 Sewers and pipes. Inert or block for.....W. Hall
 Sewing-machine attachment.....T. A. eate
 Shaft-supporter.....W. Lowe
 Sharpening device. Razor.....L. Alfano
 Sheet-metal-corrugating machine.....G. B. Johnson
 Shipping-case.....W. E. Smith
 Shocking attachment for binders.....J. T. Coulter
 Shocking attachment for binders.....J. A. Isaman et al
 Shoe-horn.....H. G. Weeks
 Sifter. Ash.....M. Froese
 Sign. Display.....G. W. Carr
 Sign-operating mechanism.....W. E. Putnam
 Signal-bell. Electric.....H. W. Eden
 Signal system. Automatic electric.....E. T. Ackerman
 Signaling apparatus. Automatic.....J. S. Anderson
 Skate. Roller.....G. S. Slocum
 Skirt marker. Dress.....C. Knopf
 Skirt-supporter.....F. J. Martin
 Smelting refractory ores and producing low-carbon ferro alloys.....E. F. Price
 Smoker's set.....N. Belisle
 Sound-record-cleaning attachment.....J. N. Blackman
 Sound-records. Sieve for use in making disk.....T. H. Macdonald et al
 Sounds. Recording and reproducing.....J. F. Dirzuweit
 Speed-mechanism controlling device. Variable.....C. T. B. Sangster
 Spike.....J. McNeil
 Spike-holder.....W. D. F. Jarvis
 Spinning-mule.....W. D. Rundlett
 Spinning-mule attachment.....R. J. Harrington
 Spinning, twisting, and winding machine.....R. Dawes
 Sprayer. Hand.....A. O. Freeman
 Spraying device.....I. Callmann et al
 Stage-brace.....J. C. England
 Stage illusions. Means for producing.....H. Goldin
 Steam-brake.....W. Mauve
 Stenographic machine.....W. J. Kehoe
 Step. Collapsible.....C. E. Fryc
 Sterilizing and filling vessels. Apparatus for.....P. Lamouroux
 Storm-front. Safety.....L. Cockerill
 Stove.....M. W. Randolph
 Stove. Folding.....W. E. Enfield
 Stove. Heating.....F. M. Reed
 Stoves, boilers, burners, and the like. Attachments for.....W. T. Kelley et al
 Stove-pipe-retaining device.....H. C. Armitage
 Stretcher.....N. D. Baker
 String-cutting machine. Bevel.....J. P. Donovan
 Swing.....F. Unger
 Switch-stand safety-lock.....R. F. Jacob
 Switching apparatus. Automatic.....R. H. Wentworth
 Tag-holder.....J. J. Guinn
 Talking-machine attachment.....H. Koch
 Talking-machine horn.....H. Koch
 Tank-lug.....J. Reichbert et al
 Target.....A. C. Meyer
 Telegraph instruments. Sound-magnifier for.....F. O. Hanson
 Telegraph. Printing.....J. E. Wright
 Telephone-exchanges. Selector for automatic.....C. E. Scribner et al
 Telephone-receiver.....E. J. Quinby
 Thawing hydrants and fire-plugs. Device for.....J. C. Moore
 Thermostat.....H. G. Geissinger
 Thermostat for centrally-heated plants.....R. Brukenhaus
 Threshing-machine.....W. L. Butler
 Tie.....W. R. Ball
 Tie.....J. Roberts et al
 Time-controlling mechanism.....A. B. and R. F. Carty
 Time switch and alarm. Automatic.....F. H. Quade, Jr.
 Timer.....C. S. Hardy

Timepieces. Repeating mechanism for.....G. Citelli
 Tire.....W. T. Wood
 Tire mold. Pneumatic.....F. Veith
 Tire. Resilient.....H. Klingler
 Tire. Rubber vehicle, 2 pats.....J. J. Hendler
 Tire-shield.....T. J. Sprinkle
 Tongs. Pipe.....E. L. Fesler
 Tongs. Roofing.....F. C. McCusker
 Tongue-support.....J. Puffenberger
 Tops. Spinning device for whipping.....G. Tresenreuter
 Toy.....J. Brown
 Track-sander. Pneumatic, 2 pats.....H. Rau, Jr.
 Traction-engine. Rack.....P. Montsahre
 Traction-wheel.....I. Mitchell
 Trolley.....J. Ashurst
 Truck.....W. F. Loyd
 Truck. Car, 2 pats.....H. S. Hart
 Truck. Motor.....W. F. Kiesel, Jr.
 Tube-forming apparatus.....C. J. Noian
 Turbine.....E. Böhle
 Turpentine-hack.....E. H. Walton
 Type font or holder.....S. Brown
 Type-writer carriage.....B. T. Bruce (Reissue)
 Type-writing and other machines. Keyboard for.....J. B. Vidal
 Type-writing machine.....C. Gabrielson
 Type-writing machine.....H. B. Wilson
 Type-writing machine.....F. A. Young
 Type-writing machine.....E. E. Burney
 Type-writing machine.....C. H. Shepard
 Type-writing machine, 2 pats.....E. B. Hess
 Valve.....J. Peterson
 Valve.....N. Koch
 Valve and sparking mechanism for hydrocarbon-engines.....L. E. Lowe
 Valve. Check.....F. P. Cotter
 Valve. Dry-pipe.....C. B. Garrett
 Valve. Flushing.....W. S. Cooper
 Valve for fluid-pressure engines.....W. C. Schaff et al
 Valve. Power-operated.....J. M. Anderson
 Valve. Retaining.....C. M. Fessier
 Valve. Screw-seat.....C. M. Hose
 Valves, &c. Machine for facing.....P. B. Williams
 Vapor. Generation of.....H. M. Pope et al
 Vapor mixtures. Apparatus for rectifying and dephlegmating.....J. J. Ponomarew
 Vegetable-cutter.....J. C. Carsley
 Vehicle and boat. Combination amusement.....J. E. Garrette
 Vehicle-brake.....C. H. Bach
 Vehicle. Land and water.....D. F. Alkin
 Vehicle-spring, 2 pats.....J. O. Lewis
 Vehicle wheel. Road.....J. Davies
 Vending-machine. Coin-operated.....F. W. Tucker
 Ventilator.....C. H. Ocumpaugh
 Ventilator or chimney-cap.....W. E. Esperson
 Veterinary dental instrument.....E. P. Weiss
 Veterinary instrument.....J. Toney et al
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 Vine-cutter.....W. K. Cooper
 Voting-machine.....O. T. Johnson
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 Wagon-brake. Automatic.....R. T. Huffman
 Wagon-dump.....J. F. White
 Wagon. Dumping.....C. Johnson
 Waist-pattern.....M. L. Carrara
 Washboard support and shield.....A. Geibel
 Washboiler.....L. James
 Washing-machine gearing.....W. W. Terriff
 Washstand. Stationary.....C. S. Blain
 Watch.....W. E. Porter
 Watch. Stem winding and setting.....E. H. Horn
 Watches. Concealed hinge for.....A. Bavier
 Watches. Plate for repeater.....F. Montandon et al
 Watchcase-pendants. Making.....C. W. Butts
 Weeder, chopper, and scuffle-hoe.....J. Carpenter
 Weighing and packing apparatus. Automatic feed.....S. and R. E. Leatham
 Weighing apparatus. Liquid.....E. W. Valenta
 Welding compound.....A. J. Hanlon
 Well-screen.....E. E. Johnson
 Wells. Oil-hoisting apparatus for.....J. M. Rettig
 Wheel.....H. Cramer
 Whiffletree-hook.....J. Pierson, Jr.
 Whip-socket and rein-holder. Combined.....A. Kormil
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 Windmill-tower.....J. H. Euhank
 Wire clip.....C. W. Sponsel
 Wire-drawing machines. Driving mechanism for drawing-through drums of.....W. Cart r et al
 Wire-payout reel.....J. P. Delpey
 Work-stand. Lady's.....L. Rodcen
 Woven fabric and weaving the same.....J. L. Poalk
 Wrapping-machine.....P. F. Lopez et al
 Wrench.....G. V. West
 Wrench.....W. B. Davis
 Wrench or nut-jack.....W. H. Oliver
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 Yoke. Animal.....J. P. Shaw

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Automobile-body.....H. E. Coffin
 Box-cover.....W. A. Jack
 Flower-pot cover.....W. H. Grever
 Match-box.....T. F. Bense
 Pincushion.....J. U. Barr
 Rug, 2 pats.....A. Petzold
 Rug.....E. H. Bennett
 Spoons, forks, and similar articles. Handle for.....G. A. Alexander
 Spoons, forks, or similar articles. Handle for.....S. J. Large
 Stove, 2 pats.....T. R. Kennedy et al
 Vending-apparatus case. Coin-controlled.....L. L. Martin
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 Account-keeping apparatus.....L. R. Tiffany
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 Adding-machine.....W. C. Paris
 Adding-machine.....F. B. Glenn
 Adjustment mechanism. Fine.....H. N. Ott
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Advertising means.....G. Carrington et al
 Agricultural machine.....A. A. Lax et al
 Air-treating machine.....C. A. Rumble
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 Amalgamator.....W. H. Stiglitz
 Applicator and dilator. Combined.....C. T. Ball
 Arcs of circles. Instrument for describing.....A. W. Allen
 Automobile driving mechanism.....G. R. Walker
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 Baking apparatus. Cake.....J. S. Hama
 Ballot-box.....D. Allcut
 Beam-frame for continuous concrete girders.....H. Haiss
 Beam-frame. Universal.....H. Haiss
 Bean-cutter.....J. W. Brown
 Bearing.....H. M. Goodsey
 Bearing. Disk.....H. E. Dodson
 Beater.....S. H. Coombs
 Bed attachment.....T. F. Scanlon
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 Belt-shifter.....A. Rosenthal
 Belts, &c. Clasp for.....H. G. Sud. II
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 Boiler safety appliance. Steam.....H. Crippen
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 Box-fastener.....E. F. Hulbert
 Box-folding machine.....C. W. Rockie et al
 Brake mechanism.....A. P. Brush
 Brake-shoe.....J. Stromeyer et al
 Brickmaking mechanism.....M. Black
 Broom-head.....E. R. Simpson et al
 Brush.....B. Littauer
 Brush and mop. Combined fountain scrub.....J. T. Huggins
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 Brush. Rotary vibratory massage.....J. Handel
 Brush for barrel-heads.....O. Neufeld
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 Bucket. Tramway.....W. S. Gemmer et al
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 Buggy. Top.....D. B. Bogard et al
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 Button-feeding mechanism.....E. P. Merwin
 Cabinet.....W. B. Madison
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 Call. Automatic time.....J. E. Boone
 Camera. Panorama.....W. A. Case
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 Car-chock.....S. R. Keeran
 Car-door hanger.....P. M. Elliott
 Car. Dumping.....C. B. Peteler
 Car grain-door. Railway.....J. Van Slyke
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 Cars. Self-acting safety appliance for street-carhureter.....L. M. Maxham
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 Carhureting and oil separating apparatus.....J. E. Seeley et al
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 Casting apparatus.....E. A. Weimer
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 Clevis.....L. B. Alger
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 Clothes-pounder.....I. Fleming
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 Clothes-rack.....D. A. Leonard
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 Cock. Combined hydrant and stop and waste.....W. R. Runch
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 Collar-support for soft shirts.....H. R. Parker
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 Commutator.....C. W. Coleman
 Compressed-air installation.....G. J. Gibbs
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 Concrete-mixer.....A. R. Parker
 Connecting mechanism.....H. E. Smith
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Cooking utensil.....C. A. Vogler
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 Cotton-picker-machine grid.....A. St. Onge et al
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 Dental plate-punch.....E. E. Bartram
 Dentist's drilling apparatus.....P. Repsold
 Denture. Artificial.....F. Ainsworth
 Denture. Removable artificial.....F. E. Roach
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 Displaying, measuring, and cutting-off machine.....W. C. Heinen et al
 Door-securer.....J. H. N. Peterson
 Door-securer.....T. B. Wilkinson
 Door lock and latch.....W. H. Hope
 Door-stop.....W. H. Fox
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 Drill.....A. F. Clark
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 Duster head. Feather.....A. Ransom et al
 Dye and making same. Triphenylmethan.....W. Herzberg et al
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 Eggs. Desiccating.....J. M. Hussey
 Electric apparatus. Forming seals and terminals for.....H. N. Potter
 Electric devices. Improving vapor.....S. Ferguson
 Electric generator and motor.....A. S. Krotz
 Electrical switch.....M. J. Kehoe
 Electrical systems. Water-jet grounder for protection against excessive potentials in.....S. Schneider
 Electroplating apparatus.....A. F. Schroeder
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 Fan. Spring.....D. Roberti
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 Fastener.....F. I. Davis
 Faucet attachment.....J. Fleury
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 Fence-post. Metallic.....W. D. McAtlin
 Fence-shear. Multiple.....R. W. Ney
 Fence. Wire.....J. B. Schneider
 Ferro-vannadium. Producing.....F. M. Becket
 Fertilizer-distributor.....J. T. Gantt
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 Filter.....J. B. Stewart
 Filter.....A. J. Clark
 Filter. Centrifugal.....H. W. Blaisdell
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 Fish-trap.....T. W. Law
 Fish trap-hook.....A. Winbush
 Fishing reel.....J. E. Pflueger
 Fishing-tackle receptacle.....O. D. Vanderhilt
 Flashing-fastener.....W. Hammann
 Floor-finishing apparatus.....E. Schenk
 Flue-stopper.....E. I. Sheldon
 Fluid-motor, 2 pats.....H. W. Kimes
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 Flush receptacle and plug.....G. P. Whittlesey
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 Fly-trap.....G. W. Stein
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 Forging car-wheels.....J. M. Hansen
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 Forms. Manufacture of solid.....G. Egly
 Friction mechanism. Variable-speed.....A. P. Brush
 Furnace-door opener.....F. J. Rell
 Furnace twyer. Blast.....H. Seidler
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Inseam-trimmer.....H. Lyon
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Mask.....R. K. Catt
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Planer-head.....J. W. Wingham
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Planter and fertilizer-distributor. Combined.....J. R. Davidson
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Propeller and steering device.....W. J. Hearn
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Railway-rail-sanding device.....I. A. McCormack
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Reduction-furnace.....R. L. Baumlne
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Ribbison-reversing mechanism.....R. A. Pollock
Rifle. Magazine.....A. Hanson
Rivet.....W. P. Bartel
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Rope-clamp.....F. P. Robert
Rotary cutter.....G. B. Maltby
Rotary engine.....W. H. Hooker
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Sash-fastening device. Automatic window.....C. H. Bellamy
Sash-lock.....D. G. Saunders, Jr.
Saw guard. Circular.....M. P. O'Regan
Scaffold.....W. Sims
Scale. Vehicle.....Z. T. Cragg
Screw-driver.....J. Lunoe
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Seal.....T. J. O'Brien
Seaming machine. Double.....G. W. Weber
Sectional mold.....W. M. Dean
Selenium cell.....W. J. Hammer
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Shade-bracket and curtain-pole support. Combined.....F. Verdin
Shade-roller.....C. N. Hiner
Shaft controller. Rotating.....M. D. Hemenway
Sharpening device. Rock-drill.....E. Lewis
Shave-registering device.....H. C. Kelley
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Shoe-holder.....H. V. D. Waldron
Shoe-making and repairing device.....L. Hackett
Shoe-race. Glass.....A. Olberg
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- Sighting device.....J. F. Meigs et al
Signals at danger. Lock for holding.....C. W. Coleman
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Slight-latching.....C. Rosenheim
Slab and core holder.....W. J. Evans
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Soap holding and dispensing receptacle. Liquid.....W. B. Garnett
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Spring-wheel.....L. J. Castiau
Spur.....J. W. Fields
Square.....A. E. Soliers
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Stair-temple.....C. E. Cory
Stamp and grinding mill. Combined.....G. C. Richards
Stanchion.....C. D. W. Thrasher
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Steam-generator.....T. R. Butman
Stenciling-machine.....B. C. Stickney
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Swinging gate.....C. A. Rockwell
Switch.....E. R. Robinson
Switch-operating mechanism.....G. F. Mooney
Tantalum. Producing technically-pure ductile.....M. von Parani
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Telephone-receiver holder.....A. D. Brittain
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Telephone system.....W. W. Dean
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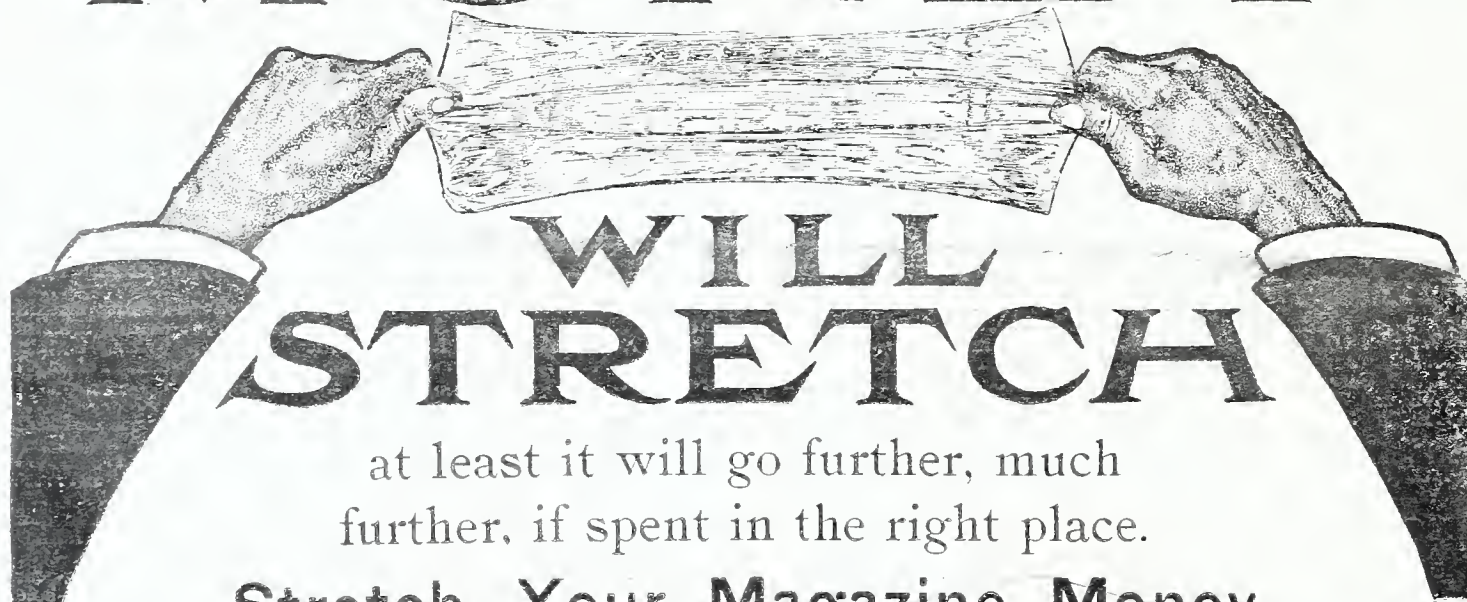
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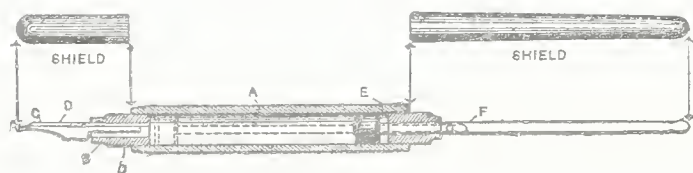


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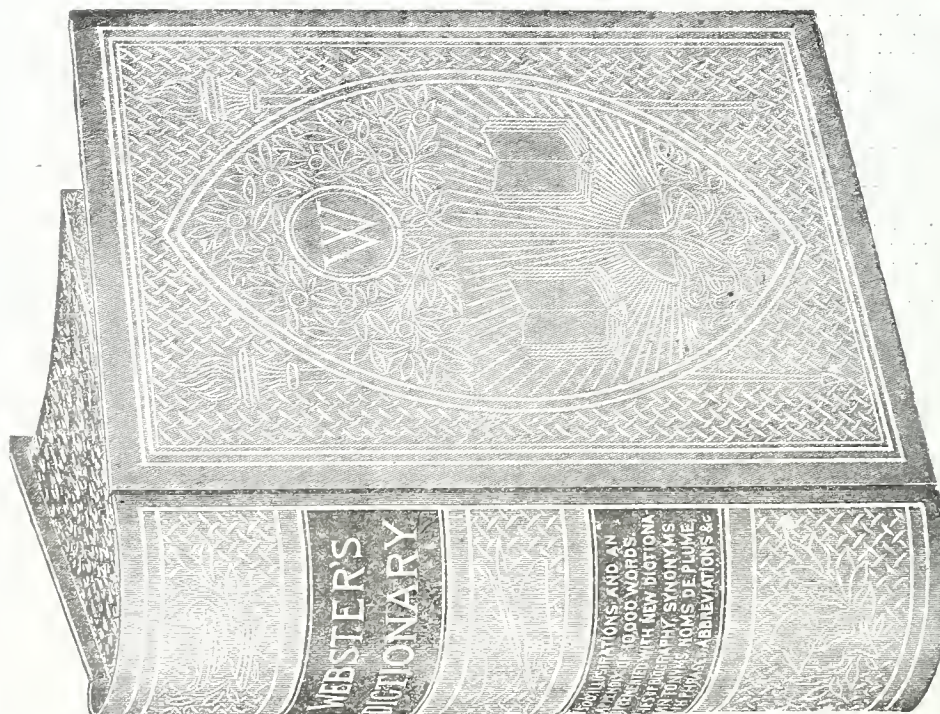
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THE QUEBEC BRIDGE.

THE collapse of the great bridge over the St. Lawrence River, near Quebec, must be ranked as one of the greatest engineering disasters in history. Not only was there a serious loss of life—74 men who were working on the bridge were killed—but public confidence in engineering construction received a severe blow. So marvelous have been the achievements in engineering work during the past century, so rapid its progress, that the world had come to believe that no task was too arduous for these skilled and daring builders. Enterprises that, a generation ago, would have been hailed as triumphs of

feet, exceeding the span of the Firth-of-Forth bridge by 90 feet. Like the latter, it was a cantilever bridge. Its total length was to be 3,240 feet, comprising the approach deck spans of 220 feet each, and a cantilever structure 2,800 feet long, made up of two 500 foot anchor arms, cantilever arms of 562 feet, and a suspended span of 675 feet. The clearance above high water was to be 150 feet for a distance of 1,200 feet. Two railway tracks, two electric car tracks, two roadways, and two footways were provided. The enormous dimensions and great live load made the bridge a huge structure in every sense. The main



FIG. 1.—SOUTH CANTILEVER ARM OF THE QUEBEC BRIDGE. FROM A PHOTOGRAPH TAKEN THE DAY BEFORE THE COLLAPSE.

engineering, are now accepted without surprise; quite as a matter of course. But in the light of this recent disaster, the question has inevitably arisen, if the profession is not willing to risk too much and overestimate its own resources.

The bridge, which was half completed, as may be seen from the accompanying illustration, (Fig. 1) crossed the St. Lawrence about nine miles above Quebec, where the river is nearly half a mile wide and 200 feet deep in mid-channel. It was to have the longest span of any bridge in the world—1,800

towers, 315 long between end pin centers, rose to a height of 400 feet above high water. The principal members were of phenomenal dimensions. The total weight of the metal work was 38,500 tons. The unprecedented size of the structure may have been one of the causes of the collapse. It cannot be attributed to incompetence. Often it has happened, where an engineering work has failed, that the ruin has been placed to the blunders of some quack wearing the professional garb. But at Quebec the task was in charge of men of

ong experience and high standing in the profession. Careful inspection of the wreck, too, shows that the material was of excellent quality. Bending, crushing, buckling, twisting and tearing were exemplified in every form; nevertheless, pliability and ductility are everywhere apparent. Plates were crushed, not cracked. The character of the material generally was satisfactory, and the workmanship round the same witness in the ruin.

What, then, could have been the reason for the fall? Among the possible causes of accident to bridges are traveler failures; unsecured connections; failures of hoisting apparatus; falling pier foundations, and—in some types—doubt as to actual stresses. All these possibilities, however, must be set aside in this case. In a simple cantilever bridge, there is no chance for doubt as to stresses, as in a suspension structure. The con-

for by using a large number. In the compression members, however, all previous sizes were exceeded; and technical experts admit, in the light of this disaster, that knowledge of the actual limits of safe stress on long steel columns of exceptional size is by no means perfect. It cannot be doubted that the designers of this huge structure used the best data at their command in proportioning both tension and compression members to the loads upon them; but in using experience on lesser structures for the design of greater, there is always a chance that some element unimportant in the small work will become vital in the larger. Careful examination, too, has shown that a chord of the compression member in the anchor arm showed signs of weakness. Several days before the accident, the chord was observed to be out of line. There was an inward bend, the amount of the deflection being about 2 inches for the

members able to safely carry this stress? Were the plates and angles of which they were built up so thoroughly braced and connected together as to make the whole member act as a unit? Their design was made and approved by the ablest engineers in the profession. No one has dreamed of doubting their strength: but now, with the testimony of that gigantic collapse, every engineer must long to know, by absolute trial, what such huge columns can safely bear."

"For, it is not proper to say that the history of several slight injuries to the buckled chord member relieves the weight of doubt in this matter by furnishing the explanation of abnormality. It cannot be said that a member is abnormal which is straight and sound enough to be per se acceptable under careful inspection. Is it at all certain that the undiscoverable variations of manufacture may not produce, in regular process, undisturbed by mishap, a column identical with this one? If inspection cannot differentiate it, what surety have we on this point?"

"No, the doubt lies farther back. We step up from the ordinary columns of ordinary construction, tried out in multiplied practice, to enormous, heavy, thick-plated pillars of steel, and we apply the same rules. Have we the confirmation of experiment as a warranty? Except in the light of theory, these structures are virtually unknown. We know the material that goes into their make-up, but we do not know the composite, the structure."

"It is at exactly this point that the Quebec Bridge failure becomes of importance

to the whole engineering profession. Until the cause is absolutely determined—if indeed it can ever be—or until the profession has actual results of tests of huge columns at its command, a cloud of doubt rests upon us as to the margin of safety in every great bridge structure: at any rate when the unit stresses are forced up to the point deemed safe by the designers of this bridge."

Jointless Floors.

The use of jointless flooring, made from pulverized wood fibre and other materials, and laid in a plastic condition on a cement foundation, was begun in Germany about ten years ago. This flooring has proved so successful that several mills manufacturing the same product were started and are now running prosperously. The problem has been to make a continuous flooring which will fit closely at its junctions with the upright walls, and be not only fireproof, but impervious to liquids, dust and vermin of all kinds.

An Electric House.

In the May number of the INVENTIVE AGE, there was given a description of an electric house in Troyes, France, in which electricity was made to take the place of servants. A fuller account has appeared in the columns of the daily press, and is worthy of reproduction, on account of the novelty of the devices described. A visit to the house is declared to be a realization of the Arabian Nights. When the visitor reaches the front gate, the pressure of a button causes the gate to open, and at the same time a phonographic voice greets the new comer. By means of a tele-photographic apparatus, the host is able to see who it is that is approaching. The meals are served entirely by mechanical power. At the pressure of a key, any dish desired appears on the table, which is constructed with an elliptical open space near the center, where there is situated a lift to convey the food from the kitchen. At intervals, music bursts from the chandeliers or the flowers on the table. After the repast is finished, the entire table drops through the floor.

The kitchen resembles an electric laboratory rather than a place to prepare food, its walls being covered with levers, commutators, amperometers, disjunctors and rheostats. The range and ovens are made of aluminum of novel shape. The cooking is done with scientific accuracy. The interior of the oven is composed of a series of reflectors and its top contains incandescent lights, by whose rays the roasting is accomplished. Eggs are boiled without water, by means of the rays of light; sauces are prepared, meats and poultry roasted, vegetables cooked, and an electric signal announces when each one is done. The meat is chopped, the coffee ground, the milk churned, the bread kneaded by electricity. A machine washes fifty dishes at once in half a minute and turns them out clean and polished.

In other parts of the household, the work is done as exclusively by electricity as in the kitchen and dining room. In the morning, you are awakened by a phonographic voice at the hour you have fixed the night before. At the pressure of a button, the window curtains open. Breakfast, papers and letters arrive in the same mysterious manner. In response to another signal, a door opens and a bathtub glides into the room. Shoes are cleaned, clothes brushed, and floors swept by electricity. The house is ventilated in the same way, and electric foot warmers are scattered about in convenient places. If you are tired, you can have an electrical massage; if you have a headache, you direct a high frequency current to your scalp and the pain will disappear. There is an appliance for stimulating and healing nearly every organ of the body. If an ill advised burglar should attempt to enter the house, the owner will be informed by means of signals just where the intruder is, and an electrical arm will shoot out and hold the rascal by the neck until the police arrive. Indeed, the whole villa is more like a fairy palace or the castle of a dream, than anything constructed of stone and cement.

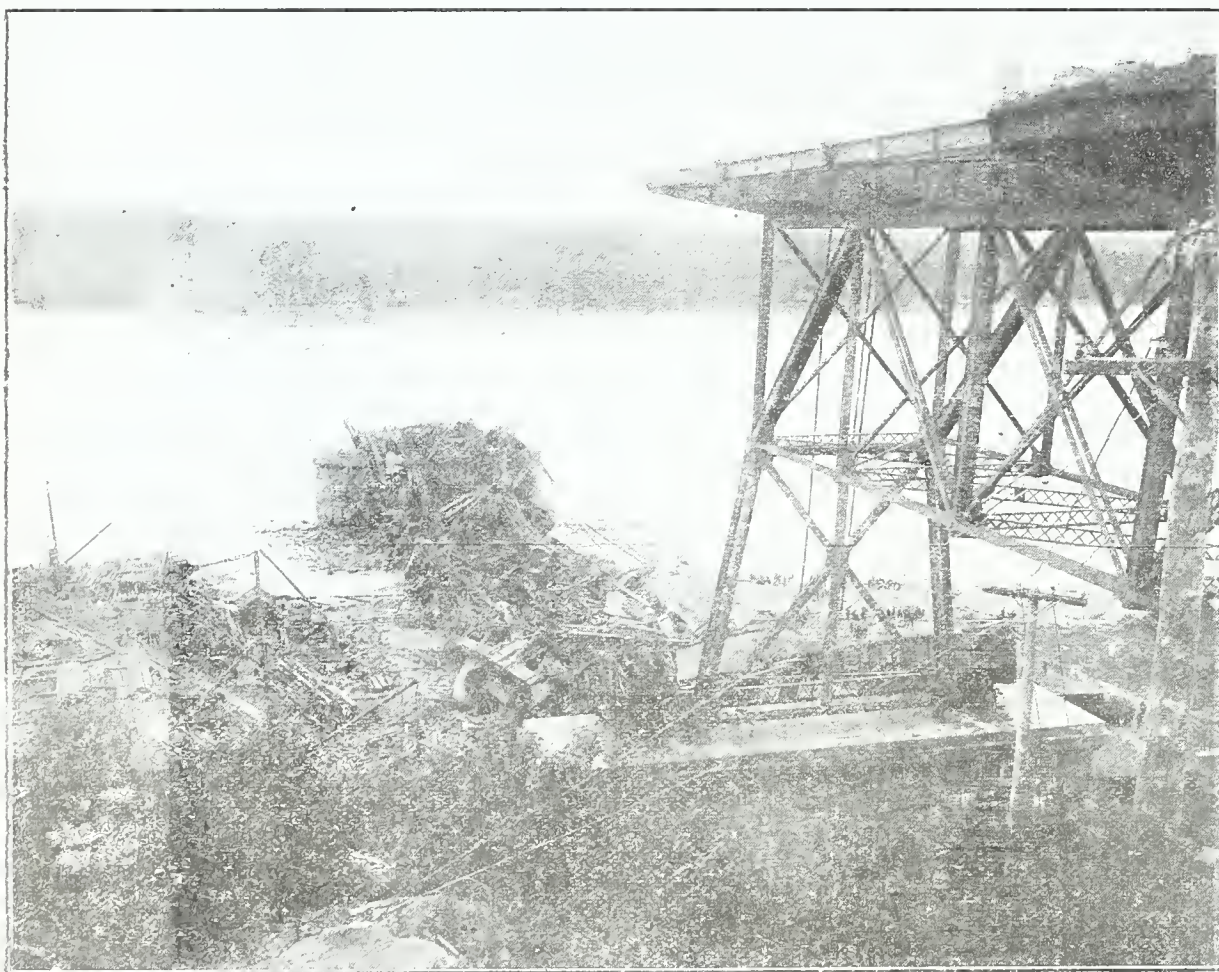


FIG. 2.—THE WRECK OF THE QUEBEC BRIDGE AFTER THE COLLAPSE.

nections were riveted as the work progressed: the traveler had been constructed with the same anxious care as the bridge itself. The piers were of the best masonry, tested with diamond drills to remove the last doubt as to its reliability at great depth. As to failures of hoisting apparatus, these seldom wreck the whole structure, and least of all would this happen on the outer arm of a cantilever bridge, nor at all in a structure of such massive proportions as that at Quebec.

It follows, therefore, that the disaster must have been due to causes peculiar to the structure itself. As already noted, it exceeded all bridges heretofore erected in the size of its main members. It did this necessarily because of the length of the span. So far as the eye-bars are concerned, equally large bars have been used on other great bridges, and the heavier stresses in the Quebec structure were provided

several ribs. The matter was reported, and the superintendent of construction telegraphed from Pennsylvania not to add any further load to the bridge until the facts had been considered. But the same afternoon the bridge collapsed. It is possible that this deflected chord was one of the causes of the wreck, though its condition was not such as to create any great suggestion of alarm.

The lack of absolute knowledge as to the strength of steel columns of enormous size, such as were of necessity used here, has been already alluded to. On this subject, an expert writes in the *Engineering News*:

"The compression members were designed for a unit stress under full dead, live and wind loads of 24,000 lbs. per sq. in., about two-thirds of the elastic limit of the metal. They were carrying at the time of failure not more than two-thirds of this amount. Were these compression

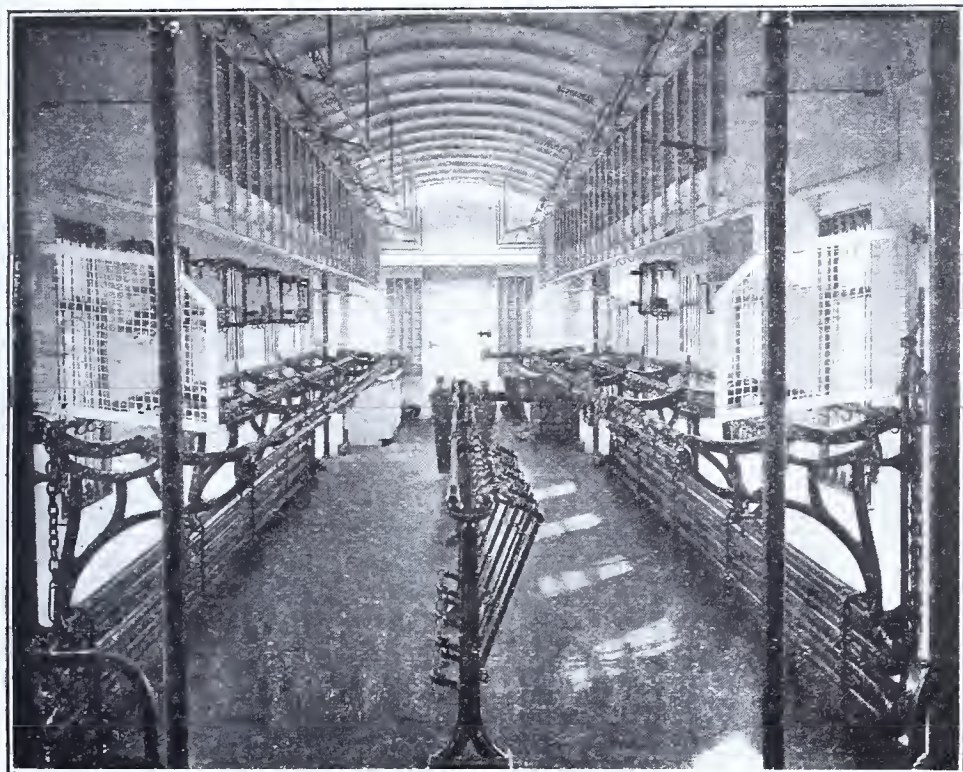
A NEW ALL-STEEL POSTAL CAR.

By CHARLES ALMA BYERS.

YIELDING to the public's demand that trains be built with greater and more symmetrical strength as a means of possibly doing away with much of the damage done by wrecks, the Southern Pacific Railway Company, at its shops at Sacramento, Cal., has just turned out the first of what is to

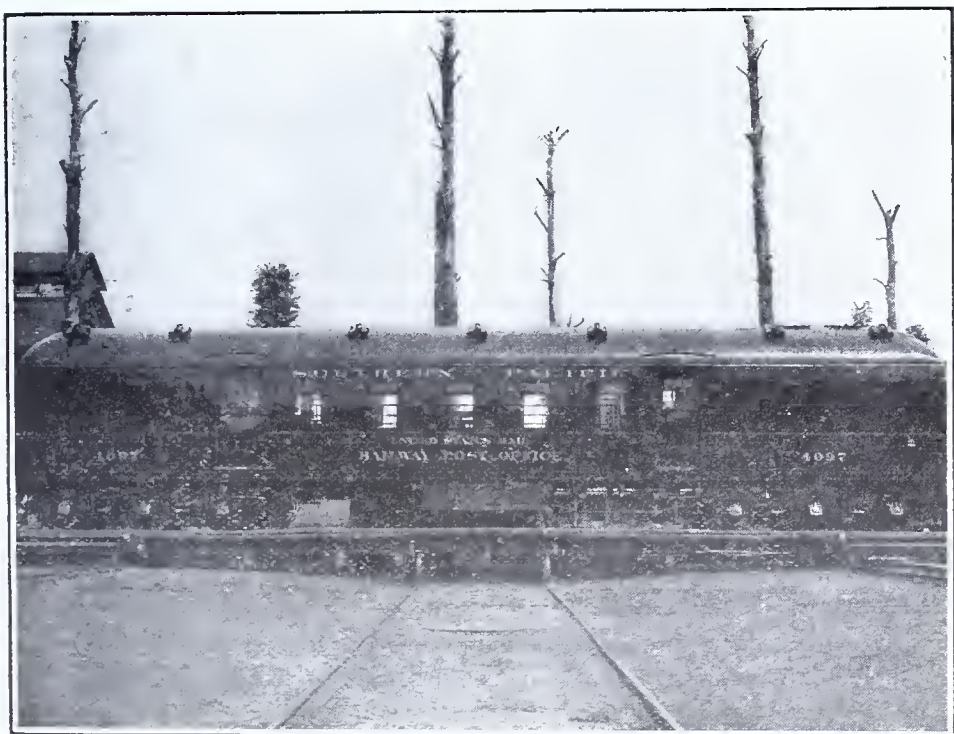
the ordinary wooden car. And it is to two massive "I" beams, that weigh 311 pounds per foot, and that take the place of the old wooden sills, that credit is mainly given for this great resistive strength.

The exterior of the car is covered with plates of steel, strongly riveted,



be a string of all-steel postal cars—a move that promises to revolutionize the industry of car building. This new mail car, constructed from designs drawn by the company's own motive-power engineers, is of steel throughout, excepting the window frames, and to the eyes of a master

as are also the roof and the ceiling. The sides of the interior are lined with asbestos, while the floor is formed by monolith laid over two courses of corrugated steel. The car is strongly braced in every direction, so strongly, in fact, that a shock might be severe enough to buckle the



mechanic appears as a thing of beauty and one that will be a joy forever.

The principal feature in the construction of this new Southern Pacific postal car to commend it to universal adoption is probably found in the fact that it is designed to withstand over 200 per cent. more shock than

entire framing without telescoping it. To lessen heavy shocks, to a great extent, a steel plate, twenty inches wide, is riveted across the top of the end framing.

In designing this style car it was the aim of the company to do away with the danger of telescoping, to re-

duce deterioration to a minimum and to create an unburnable barrier between the locomotive and the passenger coaches, thus giving greater protection and safety to the entire train. It also places the postal employees in a far more secure position.

The car is provided with electric and steam heating appliances, automatically regulated, and the fittings, racks and apparatus used in handling the mails, all of steel or brass, are of the most modern inventions.

The all-steel postal car is unquestionably a great improvement in train building, and when the time comes that trains are constructed of steel throughout it may be said that builders have neared the summit of perfection in their art.

The Hydroplane Boat.

A boat that does not cut through the water but glides over the surface of it at a speed of forty miles an hour, deserves to be called the most stupendous invention in the annals of craft, and would give pause to belief, if the claims for it were not supported by the names of eminent engineers. Peter Cooper Hewitt, the discoverer of the famous mercury vapor lamp, is the inventor of this boat, which does not cut through the water as do other vessels, but actually skims the surface, the body being high enough to permit free play for the waves beneath.

For some years there has been a tendency on the part of inventors to seek new lines of development for water craft, and hydroplane boats have been described in the INVENTIVE AGE from time to time. It will be readily seen that in such a vessel, less surface would be exposed to the water; consequently friction would be enormously diminished. Boats on a small scale were first made with a surface hydroplane, so that when a good speed was secured by means of the screw propeller, only the rear third of the plane carried the weight of the vessel. This boat marked a forward step, but it had the disadvantage of having the waves strike heavily upon that part of the plane which projected above the water.

Mr. Hewitt's hydroplanes differ from that described, in that they are submerged instead of being on the surface. The boat has a hull of mahogany, with rounded bow and stern, the hull having a frame of heavy steel tubing. The power is derived from an eight-cylinder gasoline motor contained in the frame and connected with a screw-propeller by a vertical shaft, the propeller being at the front end of the boat, so that the vessel is drawn, and not pushed across the water.

From each corner of the steel frame are dropped into the water perpendicular steel arms. These arms extend 18 inches below the bottom. To the arms are fastened steel planes, having a slant upward in front of about one in eight. These hydroplanes, which are very thin, are arranged in terraces, like steps. The bottom ones have two square feet of surface and those above are larger. The total supporting surface of the

four principal planes, therefore, is eight square feet. These figures, will be understood, refer to the present model with which Mr. Hewitt has been experimenting.

Across underneath the boat a horizontal strip extends, connecting the uppermost planes of each pair. The larger planes are placed with their forward upper edges about on a level with the bottom of the boat, projecting outward several feet from the side. When the boat is not moving, these planes are not noticeable; but their action, when the boat has attained a certain speed, is remarkable. On first starting, the vessel moves forward like any other boat; but when a rate of 12 miles an hour is reached the slant of the planes causes the craft to rise out of the water, and the top-most planes become visible. The greater the speed, the higher the craft rises. When the uppermost planes are out of the water, part of the supporting surface is lost and the craft settles lower, this principle constantly operating to maintain a perfect level for the shell at a given distance above the surface of the water. At a speed of 16 miles an hour, the craft proper does not touch the water, but is carried several inches above the surface. The contrivance now runs merely on the planes, and of course the friction is greatly reduced. A speed of 38 miles an hour was attained in the trials on Long Island Sound, and probably this would have been exceeded, had it not been for one drawback: the waves would occasionally strike against the bow of the vessel and the planes, that were out of the water. The force of this impact, when the boat was going at 30 miles an hour or over, was tremendous, and seams were opened and water driven into the boat. This, however, the inventor asserts, can be remedied by placing the step-like sets of planes deeper in the water and securing speed enough to raise the hull a foot or more above the surface.

Observers of the experiments are enthusiastic about the future of this new style of boat. The inventor believes that, since he has made such speed with a rough model and under the necessarily adverse conditions that always confront the early development of an idea, a much higher rate can be attained. With a hundred foot vessel, 55 miles an hour is not too much to hope for. This would mean a trip across the Atlantic in thirty hours, and would make the achievements of the turbine steamers seem as slow as the crawl of the tortoise. Another advantage claimed is that nothing like the great horse power now necessary with vessels of that size would have to be used. One ardent advocate of this new vessel is M. Santos Dumont, the famous inventor of airships. Perhaps the similarity between the planes of this boat and the wings of the aeroplanes is what has aroused his interest—for it should be noted that this pioneer of the air has given up his dirigible balloons, and is devoting himself to motor-driven flying machines. Such faith has been in the hydroplane boat that he has made a bet of \$10,000 that he can build a vessel on these lines that will make 60 miles an hour. His hopes and those of Mr. Hewitt may not be fully realized, as a boat large enough to cross the ocean may present new and insuperable difficulties in this style of construction; but the hydroplane has already made a name and a place for itself, and the world will hear more of it in the near future.

CLEVER NEW PATENTS.

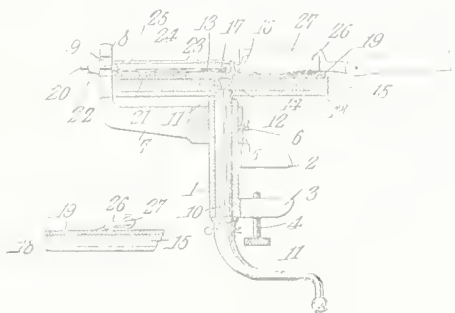
Flue Stop.—Razor Strop—Carpet Stretcher and Tack Hammer Combined. A Novel Pump.

Flue Stop.

A novel form of flue stop has been patented by Mr. George A. Higgins, of New York, N. Y. Such devices are employed for house hold use during the winter months, when they are not in use. The stop is placed in the ordinary flue which leads to each chimney, for the purpose not only of preventing cold air from passing down the chimney, but also that a covering may be placed thereon, such as wall paper. It is also desirable that such flue stop be durable, decidedly economic of manufacture, easily and quickly applied or removed, strong, effective, and that it be simple in construction. All these advantages are claimed for this flue stop. It consists of a stop or plate 8 which is, dished, forming a marginal flange 11. To the dished part is secured a strap 2 of spring sheet metal having its ends engaged in keepers 9a. The strap is substantially in the form of a bow of greater width than the flue, and has outwardly angled portions 12, which effectively engage the flue walls and maintain the stop in position.

Razor Strop.

A simple contrivance for stropping razors has been patented by Mr. Elijah L. Deputy, a well known inventor, of Wilmington, Del. who has assigned one-half interest of his patent to Dilworth B. Perry, of the same city. The principal aim is to provide

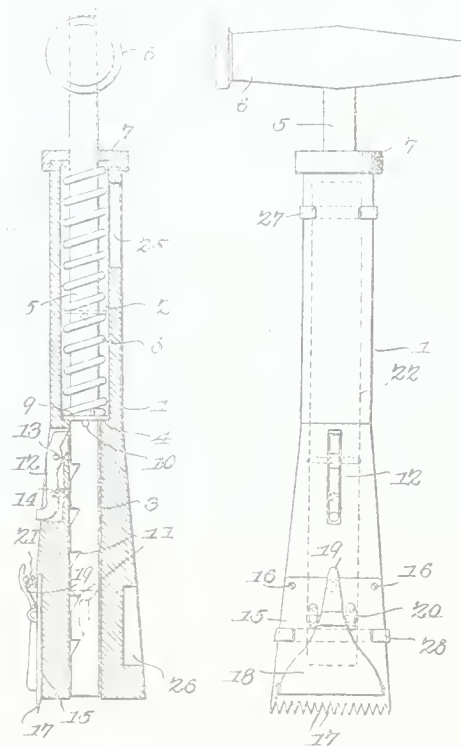


a simple device which will quickly sharpen a razor blade, and will automatically reverse the blade upon the sharpening surface whenever the movement of the surface is reversed. A bracket frame 7 is employed having jaws 2 and 3 arranged to be clamped by a set screw 4 to a table or other suitable support. An upright shaft 10

is journaled in the bracket frame, and has a crank handle 11 at its lower end. On the upper end of the shaft is fixed a revoluble table 15, which is reversible, being provided on opposite sides with stropping faces 18 and 19, of stone and leather respectively. The bracket frame has an upstanding arm 8, in which is secured a spindle 21, on which is mounted a revoluble tube or razor holder 22 having a razor blade receiving clip 23. The clip extends over the outer side of the table and is arranged to receive an ordinary razor 27, as shown. With this structure, if the handle 11 is revolved, the table 15 will of course be rotated and the sleeve 23 caused to partly revolve, swinging the razor blade downward so that the edge of the razor blade will be properly held against the stropping surface. Upon the rotation of the table in an opposite direction, the sleeve will be revolved and the clip will be automatically reversed, throwing the other face of the blade against the sharpening disk. This operation is repeated until the razor blade is properly sharpened.

Carpet Stretcher and Tack Hammer Combined.

The accompanying illustration gives a very good idea of a combined carpet stretcher and tack hammer recently patented by Mr. Dabney L. Ervin, of Columbus, Miss. The object of the invention is to provide a simple device whereby a carpet can be



stretched, and while held, can be tacked. The hammer is power-driven and capable of being conveniently tripped or released so as to drive the tack without relieving any of the strain from the carpet, whereby the carpet may be effectually tacked at the point to which it has been stretched.

A stock 1 is employed that is tubular in form, and has a metallic stretcher plate mounted on one side of its lower end, the stretcher plate being provided with teeth 17. Slidably mounted in the bore of the stock is a shank 5 provided in its side with a series of teeth 11, arranged to be engaged by a dog 12. A spring 8 urges

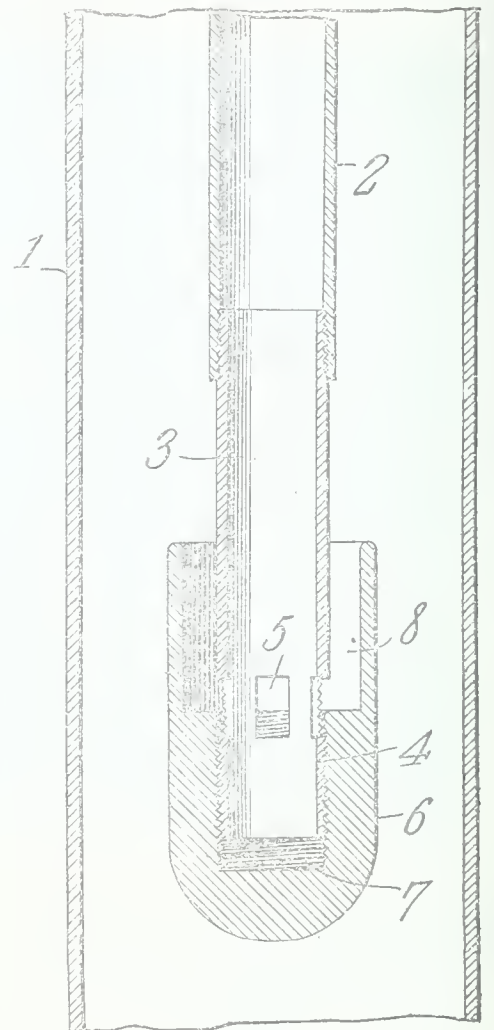
the shank downwardly, and the upper end of this shank has a cross head 6 in the form of a hammer head. The shank is a permanent magnet. In using the device, where the carpet is to be stretched, the shank is drawn upwardly and held by the dog 12, in which case the spring 8 is compressed. A tack is then placed against the lower end of the shank, and the carpet is engaged with the teeth 17. When tightly stretched, in order to tack it, it is only necessary to operate the dog 12 to release the shank, whereupon the spring 8 will act to slide the shank downwardly and thereby drive the tack. Under ordinary conditions, when there is no stretching to be done, and it is desired to use the hammer head 6, the handle 22 is detached, whereupon the device may be employed in the manner of an ordinary tack hammer.

A Novel Pump.

A novel pump, particularly intended for elevating water, oil or other liquids from deep wells through the medium of compressed air, has been patented by Mr. Thomas Foy, of Freehold, N. J. The illustration is a vertical sectional view through the lower end of the pump. The well casing is shown at 1, and extending downwardly into the lower portion of the well, below the level of the liquid therein, is a central pipe 2 that is connected to some suitable source of compressed air. A section 3 is attached to the lower end of the air conducting pipe 2, and has its lower end exteriorly threaded, being furthermore provided with a number of elongated openings or ports 5 that are formed in the threaded portion. A cylindrical block or foot piece 6 is screwed upon the lower end of the section 3, as shown at 7, and has its upper end formed into a cup 8, the lower end of which registers with the openings 5. It will be evident that these openings may be more or less uncovered by screwing the foot piece 6 to different

positions on the pipe section 3. The bottom of the foot piece is made hemispherical so as to offer as little resistance as possible to the upward flow of the liquid in the casing 1.

The operation is substantially as follows: The foot piece is located in the well a sufficient distance below the surface of the liquid in the casing 1, and air under pressure is then introduced through the pipes 2 and 3. This air escapes through the openings 5 into the chamber or cup 8, and will be directed thereby upwardly against the



body of liquid contained within the casing. The body of compressed air at a suitable pressure, being ample, will lift the liquid above it until it finally escapes through a suitable outlet at the top of the well. Inasmuch as the steam of air is constant, and fresh liquid is also constantly taking the place of that elevated, there will be delivered at the upper end of the well casing a steady stream of liquid.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

GUNN et al. v. BRIDGEPORT BRASS CO.

(Circuit Court, S. D. New York. July 5,
1906. 148 F. R. p. 239.)

1. PATENTS—ANTICIPATION.

A patent is not anticipated by prior patents for devices which might by slight modifications have been made to perform the functions of that of the later patent, where it does not appear that the patentees had in mind their use or adaptation to accomplish such result.

2. SAME—INFRINGEMENT—CARD RECORDS.

The Gunn patent, No. 583,227, for a system of card records, claims 1, 2, and 3, were not anticipated, and cover a meritorious improvement over prior systems which involved invention. Also held infringed.

DWINELL-WRIGHT CO. v. CO-OPERATIVE SUPPLY CO. et al.

(Circuit Court, E. D. Pennsylvania. Oct. 27,
1906. 148 F. R. p. 242.)

1. TRADE-MARKS AND TRADE-NAMES.

The name "White House" and the picture of the White House at Washington constitute a valid trade-mark and trade-name for coffees.

2. SAME—PRELIMINARY INJUNCTION.

Where plaintiff claims that defendant has violated its trade-mark and trade-name, a preliminary injunction will issue, though defendant before suit was brought had partly modified its carton so as to remove the more objectionable features.

ENTERPRISE MFG. CO. v. BENDER et al.

(Circuit Court, N. D. Ohio, E. D. October 12,
1906. 148 F. R. p. 313.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR TRADE—REPAIRS FOR UNPATENTED MACHINE.

Complainant manufactured and sold an unpatented meat chopper called the "Enterprise," which name was registered as a trade-mark, and also parts for replacing those that became worn which were marked with complainant's name. Defendants also made such replacing parts, selling them in packages marked to show for what machine they were made and by whom, but the parts themselves were not identified by any mark. Held, that defendants, while having the right to make and sell the parts, were not entitled to do so without clearly marking the same to prevent their being mistaken by retail purchasers for those made by complainant for its own machines.

LIBRARY BUREAU v. FRED MACEY CO., Limited.

(Circuit Court of Appeals, First Circuit.
October 9, 1906. 148 F. R. p. 380.)

PATENTS—VALIDITY AND INFRINGEMENT— CARD RECORDS.

The Williams patent, No. 623,857, for improvements in card records, is void for lack of invention, in view of the prior art, as are also claims 3 and 4 of patent No. 634,597 to the same inventor; but claims 1 and 2 of the latter patent, which cover a group of laterally reversible twin tab cards, disclose patentable novelty and invention. Also held infringed.

NATIONAL CASH REGISTER CO. v. GROBET et al.

(Circuit Court, S. D. New York. September
26, 1906. 148 F. R. p. 385.)

PATENTS—INFRINGEMENT—RECONSTRUCTION OF PATENTED MACHINE.

Complainant manufactured and sold without restriction two styles of patented cash registers, numbered, respectively, 78 and 79. The two were alike, except that No. 79 contained an additional printing device, which, in combination with the other parts, was covered by a separate patent. Defendants, who were repairers of cash registers and dealers in second-hand machines, becoming the owners of one of each style of machine, removed from the No. 79 the printing device, which was its distinctive feature, and attached it to the No. 78, without the addition of any new parts, making in effect a No. 79 machine. Held, that such action was not an infringement of the patent covering such machine.

RUSSELL v. WINCHESTER REPEATING ARMS CO.

(Circuit Court, D. Connecticut. November 2,
1906. 148 F. R. p. 388.)

1. PATENTS—INFRINGEMENT—COMBINATIONS.

A combination patent is not infringed by a device which is not only structurally different, but does not perform by reason of its combination various functions which are inherent necessities of the patented combination and have been specifically pointed out in the specification.

2. SAME—MAGAZINE GUN.

The Russell patent, No. 501,367, for a magazine gun, claims 4, 8, and 29, construed, and, as limited by the prior art, their language, and the proceedings in the patent office, held not infringed.

GOSS PRINTING PRESS CO. v. SCOTT.

(Circuit Court, D. New Jersey. February
13, 1906. 148 F. R. p. 393.)

PATENTS—SUITS FOR INFRINGEMENT—AC- COUNTING BEFORE MASTER.

It is held that, on a reference for an accounting by defendant under a decree finding infringement of a patent, the defendant is the only "party accounting" within the meaning of equity rule 79, and complainant cannot be required to bring in an account as therein provided.

GOSS PRINTING PRESS CO. v. SCOTT.

(Circuit Court, D. New Jersey. April 5,
1906. 148 F. R. p. 394.)

WITNESSES—CROSS-EXAMINATION—PATENTS— SUIT FOR INFRINGEMENT—ACCOUNTING BEFORE MASTER.

The defendant, on an accounting before a master for infringement of a patent, is not entitled to cross-examine complainant's counsel on a so-called "statement" filed by him at the close of complainant's evidence, and being merely a summary prepared from the evidence taken which does not constitute original evidence.

WHITING SAFETY CATCH CO. v. WESTERN WHEELED SCRAPER CO. et al.

(Circuit Court, N. D. Illinois, E. D. May 23,
1905. 148 F. R. p. 396.)

PATENTS—SUIT FOR INFRINGEMENT—PARTIES.

A corporation and an individual may be joined as defendants in a suit for infringement of a patent, where it is alleged that the individual defendant owns practically all of the stock of the corporation and personally directs its affairs, and that they conspired together to commit the acts of infringement.

HARTFORD PRINTING CO. v. HARTFORD DIRECTORY & PRINTING CO.

(Circuit Court, D. Connecticut. July 30,
1906. 148 F. R. p. 470.)

1. COPYRIGHT—INFRINGEMENT—PROFITS RE- COVERABLE.

On an accounting by a defendant for profits realized from the sale of a directory which infringed complainant's copyright, the amounts received from advertisers are to be included in the gross receipts, to be accounted for, less the necessary cost of producing and disposing of the copies sold.

2. SAME.

In computing the profits realized by an infringer of a copyright for which he is accountable to the owner, where a greater number of copies of the infringing publication were printed than were sold, he is entitled to have deducted from the gross receipts all of such items of cost as would have been the same, had no more copies been printed than were sold, such as providing the copy and composition.

UNITED STATES PLAYING CARD CO. v. A. G. SPALDING & BROS.

(Circuit Court of Appeals, Second Circuit.
April 24, 1899. 148 F. R. p. 620.)

PATENTS—INFRINGEMENT—DUPLICATE WHIST TRAYS.

The Bisler patent, No. 525,941, for a duplicate whist tray, is not for a primary invention, but covers improvements only on existing trays, and its claims must be strictly limited to the improvements described. As so construed, held not infringed.

COLUMBUS CHAIN CO. v. STANDARD CHAIN CO.

(Circuit Court of Appeals, Sixth Circuit.
October 20, 1906. 148 F. R. p. 622.)

1. PATENTS—ANTICIPATION BY FOREIGN PATENT—BURDEN OF PROOF.

A patent will not be invalidated for anticipation by a foreign patent of prior date, if the invention is shown to have been made by the American patentee before such date; but, where anticipation is otherwise clear, the burden rests upon him to establish such priority beyond a reasonable doubt.

2. SAME—MACHINE FOR DIMENSIONING CHAIN-LINKS.

The Carroll patent, No. 620,826, for a swaging device for regulating the dimensions of chain-links, is void for anticipation by the Swiss patent to Goerke, No. 9,592, which covers a device substantially the same in all its parts and intended to accomplish the same result, but also, in addition, for use in welding the links.

PARDY et al. v. J. D. HOOKER CO.

(Circuit Court of Appeals, Ninth Circuit.
October 29, 1906. 148 F. R. p. 631.)

PATENTS—SUIT FOR INFRINGEMENT—USE BY EMPLOYER OF INVENTOR.

A suit for infringement of a patent cannot be maintained against a defendant who employed and paid the patentee to build the machines embodying the invention, for which the patent was afterward applied for and obtained, under an agreement that defendant was to pay all costs and expenses, and was to own any patent that should be issued, and where the machines so built were used by defendant, not only without objection on the part of the patentee, but under his direction.

FORD v. CHARLES E. BLANEY AMUSEMENT CO. et al.

(Circuit Court, S. D. New York. November
5, 1906. 148 F. R. p. 642.)

1. COPYRIGHT—CONSTRUCTION OF STATUTE.

The copyright act should be liberally construed, with a view to protect the just rights of authors and to encourage literature and art.

2. SAME—REQUISITES—MAGAZINE ARTICLE.

The proprietor of a magazine, who is also the owner of an article published in it, secures a valid copyright of such article by duly copyrighting the number of the magazine in which it is printed.

3. SAME—RIGHT OF DRAMATIZATION.

Under Rev. St. § 4952 [U. S. Comp. St. 1901, p. 3406], providing that "authors or their assigns shall have exclusive right to dramatize or translate any of their works for which copyright shall have been obtained under the laws of the United States," it is not necessary that an author should himself have taken out a copyright of his book in order to preserve the right of dramatizing it, but it is sufficient if a copyright has been secured by any one having the right to obtain it, and the author may reserve the right of dramatization while selling the right to publish the book to another, who, as proprietor, may copyright it in his own name.

4. SAME—ACTION FOR INFRINGEMENT—PLEADING.

In an action for infringement of a copyright, it is not sufficient to allege generally in the bill or complaint that all conditions and requisites required by the laws of the United States to obtain a copyright have been complied with, but the specific acts done and necessary to constitute such compliance with the law must be affirmatively alleged, and the complaint must also show that the person in whose name the copyright was obtained was the person who owned the right and was entitled to it.

LOUDEN MACHINERY CO. v. JANESVILLE HAY TOOL CO.

(Circuit Court of Appeals, Seventh Circuit.
October 2, 1906. 148 F. R. p. 686.)

1. PATENTS—INFRINGEMENT—HAY CARRIERS.

The Burkholder patent, No. 490,738, for an adjustable stop device for hay carriers, is limited as to all of its claims to a device having extending wings as shown in the specification and drawings. As so construed, held not infringed.

2. SAME—INVENTION.

The Loudon patents, Nos. 493,216 and 526,839, both for track hangers for hay carriers, show only combinations of old elements each previously used to perform the same functions in analogous arts, and are void for lack of invention.

ELECTRIC STORAGE BATTERY CO. v. GOULD STORAGE BATTERY CO.

(Circuit Court, S. D. New York. October 11,
1906. 148 F. R. p. 695.)

PATENTS—INFRINGEMENT—ELECTRIC CURRENT REGULATOR.

The Mailloux patent, No. 430,868, for a regulator for electric currents, was not anticipated and discloses invention in the placing of the regulating coil in the working circuit, but in view of the prior art it is limited to such feature, and is not infringed by the device of the Hubbard patent, No. 651,654, in which such coil is placed in the generating circuit.

HARMON S. PALMER HOLLOW CONCRETE BLDG. BLOCK CO. v. PALMER.

(Circuit Court, E. D. New York. April 26,
1906. 148 F. R. p. 702.)

1. PATENTS—INFRINGEMENT—MACHINE FOR MOLDING BUILDING BLOCKS.

The Palmer patent, No. 515,501, for a machine for molding building blocks, construed, and held not infringed.

2. SAME.

The Palmer patent, No. 623,686, for a machine for molding building blocks, construed, and held infringed as to claims 6 and 7, and not infringed as to claims 8 and 14.

DAVIS & ROESCH TEMPERATURE CONTROLLING CO. v. TAGLIABUE et al.

(Circuit Court, E. D. New York. July 18,
1906. 148 F. R. p. 705.)

PATENTS—AGREEMENT TO ASSIGN FUTURE INVENTIONS—ENFORCEMENT IN EQUITY.

By contracts between defendant, an inventor, and two other persons, defendant assigned to each of such persons a one-third interest in inventions for which applications for patents were pending, and agreed to devote his best skill and energy to the making of improvements and further inventions in the same art, and to assign a like interest in all such inventions. Subsequently complainant corporation was organized by the three, to which the patents then issued were assigned, and defendant also assigned inventions covered by certain pending applications "and any and all inventions of like nature or similar thereto which I have already completed or which may hereafter be completed by me." Thereafter, while a stockholder in and an employee of complainant, he made other similar inventions which he assigned to complainant pursuant to such contracts, and also two similar inventions for which he subsequently obtained patents, which he assigned to his co-defendant after leaving complainant's employ. Held, that complainant was entitled to a decree as against both defendants requiring the assignment to it of such patents: it being shown that the second defendant had knowledge of the terms of the contract at the time he took the assignments.

LOCKLIN et al. v. BUCK.

(Circuit Court, E. D. New York. May 7,
1906. 148 F. R. p. 715.)

PATENTS—INFRINGEMENT—WOVEN WIRE FABRIC.

The Locklin and Fox patent, No. 655,258, for an improvement in woven wire fabrics, which consists in flattening the ends of the coils to bring the wires into a common plane, and binding the same "by a metallic strip folded longitudinally so as to inclose the flattened ends of the coiled strands of the fabric and then folded again upon itself," discloses patentable invention, and is valid in view of its acknowledged utility, but is limited by its language to the use of a strip which is folded "again upon itself," and is not infringed by a construction in which the upper side of the binder as first applied is narrower than the lower side, and the second fold is made upon the fabric.

EASTWOOD et al. v. CUTLER-HAMMER MFG. CO. et al.

(Circuit Court, E. D. Wisconsin. November
16, 1906. 148 F. R. p. 718.)

1. PATENTS—SUIT FOR INFRINGEMENT— PLEADING.

A bill for infringement of a patent must specifically allege all of the facts necessary to show the validity of the patent under the statutes, and a failure to allege that it was issued in the name of the United States or under the seal of the Patent Office, or that it was signed by the Commissioner of Patents, renders the bill demurrable.

2. SAME.

A bill for infringement of a patent containing a number of claims must specifically enumerate the claims to be relied on, and where it does not the objection may properly be raised by demurrer on the ground that it is inequitable and unconscionable.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Edward Ethridge, Van Buren, Ark. Harrow.—The object of the invention is to improve the construction of harrows, and to provide a simple, inexpensive and efficient one of great strength and durability, having teeth capable of adjustment to arrange them either straight or at an angle, and adapted also to be left loose to avoid collecting and carrying trash. A further object of the invention is to provide a harrow, adapted to enable the draft animals to be hitched to it at various points to change or vary the distance between the rows of teeth. The invention comprises harrow sections having transverse bars provided with eyes, pivots arranged in the eyes and hinging the harrow sections together, fastening devices securing the transverse bars to the harrow sections and provided with nuts, harrow teeth, and means, in the form of ratchet washers, for securing the harrow teeth to the harrow sections, said means also serving to lock the nuts against rotary movement. Another feature of the invention consists of providing the harrow sections with eyes, in combination with a substantially U shaped clevis having its sides arranged in the eyes to form a double hinged joint, said clevis extending beyond the eyes to receive a draft attachment.

Fred S. Williams, inventor; C. F. Hesser, assignee, Amsterdam, N. Y. Exhaust Muffler.—This invention has special reference to the silencing of the exhaust from automobile motors, though applicable in any relation where it is desired to muffle the exhaust of expansive fluid. An object of the invention is to cause the exhaust to be condensed prior to its final liberation in order to eliminate the noise which would be occasioned by its immediate outflow. This object is effected by compelling the exhaust to pursue a circuitous course through air cooled chambers which are so arranged that the air used for cooling purposes will induce an ejective action, serving to stimulate the circulation of the exhaust fluid or gases through the muffler, and thus materially reduce the back pressure occasioned by devices of this character.

Isaac F. Pheils, Woodville, Ohio. Universal Time Piece.—By means of this invention, which is shown applied to a watch, the time in any part of the world may be ascertained without the necessity of calculation. It consists of a time piece having hour and minute hands and their respective arbors, a twenty-four hour dial rotatable on the hour arbor and held in place by the hands, a rigid twelve-hour local time dial surrounding the twenty-four hour dial, and a peripherally secured geographical dial surrounding the local time dial and supporting the same, the several dials being located in the same plane, standard meridian lines extending over both the local time dial and the geographical dial from the periphery of the twenty-four hour dial.

George B. Mellinger, inventor; Jos. R. Stauffer and Robert Skemp, assignees, Scottdale, Pa. Process of an Apparatus for Producing Metallic Tubes. Two Patents.—The object of the invention is to produce tubes of any desired length by bending the skelp or blank in a manner to create a normal tendency of the tube to contract, and thus effectually close the joint or seam formed by the meeting of longitudinal edges of the skelp.

The apparatus is so constructed that the various steps of the process may be performed simultaneously at successive points of the blank or skelp, in order that the manufacture of the tube may be accomplished continuously until a tube of the desired length is completed, without the necessity for the handling of the metal except such as is necessary to present it to the apparatus.

The apparatus employed comprises a series of skelp-bending rolls arranged to bend the skelp into cylindrical form, a series of edge-flexing rolls disposed beyond the skelp-bending rolls to flex one edge of the tube inwardly, tube contracting rolls disposed in quartering relation about a constricted pass within which the tube is contracted to convolute form, a mandrel disposed to expand the contracted tube to its original cylindrical form, and a die arranged to flex outwardly beyond its normal plane that edge of the tube which was previously flexed inwardly from its normal plane. By contracting the tube, and then expanding the same to its normal size, the tube exerts a constant tendency to spring back with the edges of the tube in abutting relation. According to the process and apparatus, either a butt-joint tube or a lap-welded tube may be formed.

James Randall, Washington, D. C., inventor; William W. Randall, same place, assignee, one half interest. Smoke Consumer.—Apparently Mr. Randall has entirely solved the problem of preventing the emission of black smoke from steam boiler furnaces, and furthermore has done so in an economical manner. In his patented construction, a rotary fan is employed, and a discharge pipe leading from the fan has branches, one of the branches delivering into the ash pit of the furnace, while the other branch leads through a heater and is in turn divided, one of the divisions leading into the furnace above the fire and the other entering the branch that delivers into the ash pit. Suitable valves are employed for controlling the various branches. Steam is preferably introduced into the discharge ends thereof. A pipe, leading from the stack, delivers into the inlet of the fan, but is of less diameter than the inlet so that fresh air is carried in with the smoke.

John H. Williams, Albion, N. Y., inventor; Varnum D. Ludington, same place, assignee, one half interest. Check Controlled Apparatus.—This invention relates to vending machines applicable to deliver an article to a purchaser upon the insertion into the apparatus of a coin of the proper value. The present invention is particularly useful for vending newspapers or other merchandise of a similar character, but is not limited thereto. A rotatable vending device is employed that includes a single disk and outstanding projections. A lever swingingly engages the projections, and comprises an actuating section having its pivot axis coincident with the axis of the vending device, and a handle section that is pivoted to the actuating section. These sections are provided with aligned slots constituting an open bottomed check receiving pocket. A pivoted lock is employed comprising a latch portion that engages successively in the peripheral notches of the disk, and a check supporting pallet is located beneath the check receiving pocket. With this construction, when there is no coin in the apparatus, the handle section can be moved freely, but if a coin is placed therein, the two sections are locked together. Moreover the coin serves to operate the latch to free the vending device so that by the operation of the handle, the vending device will be properly rotated. This will carry the coin to a position where it will fall from the

pocket and free the parts, again locking the vending device against movement.

Tomsom E. French, Davenport, Iowa. Window Frame.—This invention is particularly intended to be attached to a window for the purpose of raising and lowering therefrom heavy objects, such as pianos and the like. A single mast is employed having a foot at its lower end that rests upon the window sill, while a block and tackle is suspended from its upper end. An arm adjustably mounted on the mast, is provided with a stop that engages against the outer side of the window frame, and with a hook that engages the inner side of the same. This hook is retained in place by an extensible keeper, comprising slidably and pivotally associated sections that bridge the space between the side bars of the window frame, the sections being adjustable to various widths of windows.

Theophiel Paul Walter, Beatrice, Nebr., inventor; Beatrice Mfg. Co., same place, assignee, entire right. Corn Husker.—This is an improvement in that class of devices which are worn on the hand and are employed for stripping husks from the ears of corn. A curved base plate is employed, to the ends of which are respectively secured wrist and palm embracing straps. The base is provided with sockets and with openings. A hook which may be double or single pronged, has a projection that engages in the sockets and has a terminal finger constituting a pivot engaged in one of the openings. A clamping screw arranged to pass through the other openings, engages the hook to hold it against movement in adjusted positions.

Henry W. Watson, Danville, Ky. Stanton Cozatte, assignee, one half interest. Chattanooga, Tenn. Tilting Bin.—The object of the invention is to provide a bin having a cover that will close tightly to keep out rodents, vermin, dirt and the like, and can be emptied with ease and expedition, being provided with an automatic opening door and with a tray into which the material can be dumped. The bin is pivotally mounted between two side walls, and beneath the walls is located a removable tray. The cover is hinged to the bin and has a link pivoted thereto. This link is detachably connected to the top of the supporting frame. A holding latch is pivoted to one of the side walls, and has a series of sockets or shoulders engaged by a pin on one side of the bin. With this construction, when the bin is swung outwardly, the cover will be automatically raised, and by detaching the link, the bin can be inverted so that the contents at the bottom thereof will be discharged into the tray.

Chas. T. Hixson, Ringwood, Okla. Ter. Tender for Traction Engines.—One of the principal features of the present invention is the provision of means that maintains the proper alignment between the engine and tender without regard to the direction of movement and without transmitting any portion of the tender load to the engine. Another feature of importance is the provision of a roof or awning for the tender, so arranged that it will always constitute a proper protection for the engineer. The tender is provided with a suitable supporting frame and spaced front and rear axles both pivoted thereto. Connections are made between the frame and the engine, these connections being in the form of links that are reinforced by crossed braces. Means are also connected to the engine for turning the axles. This means comprises devices arranged to be connected to the steering gear of the engine, being connected to the axles and

closer to the pivot axis of one than of the other, in order that a differential turning movement of such axles will be produced upon the movement of the steering gear.

F. Henry Meyer, Deshler, Ohio, inventor; The U. S. Cement Machine Co., same place, entire right, assignee. Two patents. These patents cover respectively Roofing Tiles and Machine for Making such Tiles.—The tile is formed of cement, and is substantially diamond shaped, being provided on its upper margins with upstanding ribs and having depending ribs on the under side of its lower margins. These ribs interfit with those of the adjacent tiles. Fastening means are employed in the form of a wire, having looped portions with portions on opposite sides of the loops embedded in the tile. The terminals are disposed in depending relation. With this construction, when the tile is applied to the roof, the terminals of the wire are passed beneath the supporting beams and engage in the loops, thus effectively securing the tile in place.

The machine comprises a base having a top wall provided with recesses. A mold body is employed having an open bottom that receives the base. Fasteners adjustably secure the body at different elevations with respect to the base. A false bottom is movably located in the body above the top wall of the base. This bottom normally rests on the top thereof. A spider frame normally located in the recesses of the top wall, is movable upwardly out of the same to elevate the false bottom, and means is employed for elevating the spider frame. The rib forming mechanism is pivotally mounted at one end of the body of the mold, and a groove forming device is pivoted on the rib forming mechanism.

Henry O. Sparks, Shelbina, Mo. Tilting Hay Fork.—This patent covers a novel form of fork. It is more particularly used in connection with a machine disclosed in a former patent granted to Mr. Sparks. A sectional handle is provided, and on the end section is pivoted the fork having a rearwardly extending arm or finger that is engaged by a latch pivoted on the section. A bail to which the elevated cable is attached, has its terminals pivoted to forwardly extending fingers carried by the ends of the fork, and a spring is preferably employed that is connected to the bail and to the handle. For the purpose of operating the latch to free the fork, each section is provided with a cable having an eye in one end and a hook in the other, the hook of one cable engaging in the eye of the cable of the adjacent section, so that no matter how many sections are employed, the latch may be readily operated from the end of the handle to release the fork.

John S. Padon, West Plains, Mo. Mobile Step Ladder.—The aim of the inventor has been to provide means in the form of an attachment, which can be readily applied to an ordinary step ladder, to permit the same being propelled from place to place while a person is upon the same. The attachment moreover is adjustable to different sizes of ladders. It is particularly useful for paperhangers, inasmuch as a paper support is provided which can be employed in connection therewith. The ladder is provided at its lower end with rollers, the rollers on the rear legs being mounted on a crank shaft. A crank shaft is adjustably mounted on the top of the ladder and has an operating handle. These two crank shafts are connected by extensible pitmans. The paper support comprises a horizontal arm having a depending shank adjustably mounted on the ladder, and a roller is journaled on the arm.



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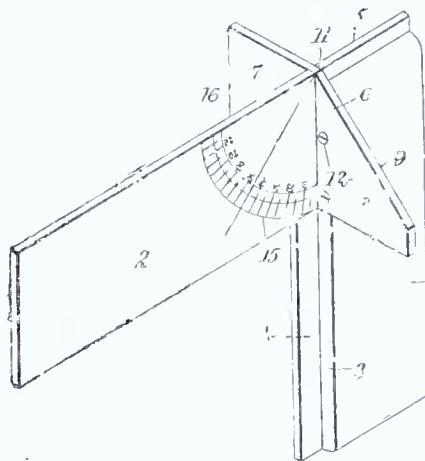
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Changes in the British Patent Law.

The new patent law which comes into force in England on the first of next January, contains a number of important changes. The practice in Great Britain has always differed materially from that in the United States. In the former country, under the old law, a patent was granted on every application, and it was left to the courts to decide as to the utility and validity of these patents. A few years ago the English Patent Office established a system of searching through records of patents in order to determine whether an invention was patentable or not. This method resembled the American system, with two notable exceptions, namely that the English search was limited to patents issued in that country only, and that it extended back only fifty years. The American search is supposed to cover patents issued in every country, as well as printed publications in every language, so that the holder of a patent, under our laws, has a fair certainty that it has not been anticipated by a prior published invention. Under the examination system as practiced by the British Patent Office within the last few years, the Comptroller General—who corresponds to the American Commissioner of Patents—was not allowed to reject an application. He could cite references and reject claims, but he could never prevent a man from securing a patent.

The new law extends the scope of the official search, and also contemplates the giving of authority to the Comptroller General to refuse a patent, if the invention is entirely anticipated by a single patent already issued.

Another change relates to the working of patents. This is something unknown in the United States, but the patent laws of all other countries require that an invention must be manufactured and placed on the market within a certain time after the patent is granted. The American patent system is unique in that a patentee is not required to take any steps toward manufacturing under the patent, but

can act like the dog in the manger and allow the invention to sleep, only to be brought to light by some later improver in the art. The British law now in vogue provides that if a patent is not worked within three years, anyone can apply to the proper officials for a license under the patent. According to the proposed amendment, a patent may be revoked, if the patented article or process is not manufactured within four years of the date of the patent. Any person can apply for the revocation, if the demand for the article is being met mainly by goods manufactured solely abroad. It is also required under the present law that taxes be paid annually after the fourth year in order to keep the patent in force. If the taxes are not paid within a certain time, the patent lapses. There was only one way of reviving a patent under the old British law, and that was by an Act of Parliament, costing in the neighborhood of several thousand dollars. The new law contemplates restoring patents which have been unintentionally allowed to lapse by the non-payment of the renewal fees.

A striking and valuable feature of the new law is that having reference to the power which an inventor will possess, of filing additional patents of improvement, which will run concurrently with the main or original patent with which the improvements are associated, but for which additional patents no fees will be demanded, beyond those necessary for the ordinary application. Thus, in future, an invention concerning which there are possibilities of improvement may be covered by one patent and six subsequent patents of addition for details, and these seven separate patents would all be kept in force by the annual payments made after the fourth year on the original patent. At the present time, on the other hand, every patent granted must be covered by its own annual renewal fee. In engineering devices, particularly, it is quite common for the patent covering a new type of pump, say, to have associated with it several subsequent patents for improvements in detail, suggested by the working of the main patent; and it has been the practice heretofore to require that separate patents should be taken out for these improvements. The new law will mean a great saving to manufacturers and engineers in connection with machines upon which improvements can be readily introduced without incurring the present annual costs, which amount to four or five hundred dollars for each improvement during the 14 years.

Another feature of interest is that which enables the applicant for a patent during his provisional period to file other provisional specifications, and then at the end to get one complete patent combining all that has been shown in the several provisional patents. This will make it impossible for a patent to be attacked on the ground of lack of conformity between the provisional and complete specifications.

Another section relates to the voiding of contracts that are made with inequitable conditions attached to

them. Unfair licenses have been granted by some patentees in the past, and industrial enterprises have in consequence been subjected to annoyance. The new law is designed to prevent this.

There are further certain clauses in reference to the power of revocation. It will hereafter be possible to have a patent revoked, if the demand is made within two years from its issue by a person who would have been entitled to oppose the grant. The term of design patents is extended to ten years. It will be seen that the changes are sweeping in their character, and will probably have a far-reaching effect on the industries of England.

The Spread of Electricity.

The recent meeting in this city of the National Electric Light Association, with its elaborate display of electrical devices, emphasizes the progress that has been made in the use of electricity for power purposes. The fact was brought out by one of the speakers that only a few years ago, electricity was considered adaptable chiefly for purposes of lighting. The first Edison central stations, for instance, were installed for the purpose of distributing electricity for incandescent electric lighting. At that time no one thought of using arc lights on the same wiring, and power was such a subsidiary portion of the business that it was hardly worth considering. The first electric elevators were installed in this connection. The fluctuation in the amount of current required in running these elevators made it difficult to maintain even pressure for lighting, so that the central station companies were opposed to this employment of the power, and actually imposed restrictions on the electric elevator companies. It is needless to say that all this is now changed, and the central stations are reaching out in all directions, anxious to furnish power. Indeed, the purposes for which electricity is now utilized are innumerable. A large amount of current is consumed for heating houses; in many tailor shops there are electric heating irons; electric soldering outfits are general, and electric cooking is spreading from the hotel to the private homes of the country. There will be found, in another column of this edition, an account of a house which is completely run by electricity, the object being to show how servants can be dispensed with and electricity substituted for domestic purposes. While such curious and ingenious applications as those described are not for the multitude, there is no doubt that the convenience and adaptability of this form of power will cause an immense extension of its use in the near future. With economies in distribution which will lead to a cheapening of the cost, mechanical power will more and more supplant manual labor. The reduced price will also hasten the movement now in progress in favor of diffused and concealed lighting. High-class residences, instead of having their rooms illuminated by lamps from the centre, will be

lighted by concealed globes, producing a mellow effect, soothing to the eye. The present methods of refrigeration will also be totally changed. Miniature electric refrigerating plants have already been designed, the operation of which is absolutely automatic. These plants have given great satisfaction wherever installed, and the convenience of such an arrangement is too obvious for comment. The push button elevators, now found only in costly residences, will also become common. The flat of the future will use electricity in many ways, now unknown, to add to the comfort and ease of the tenant. Each apartment will be provided with an electric dish washing machine, and will be constantly supplied with pure air, while the meals will be served by means of a system of signals and dumb waiters, after the fashion of the automatic lunch counters now found in large cities. Cooking will be made a negligible task, with the help of electric saucepans and other devices, which can be maintained at just the right temperature by placing a switch in different positions. The reduced cost of power will be felt not only in the home but in all lines of industry, and wherever machinery is employed, goods can be manufactured at less price with the aid of this agent.

Peat as Fuel.

Mother Earth, besides furnishing our food supplies, is to be made to provide the fuel to cook them and to warm us in winter: and this not in the shape of coal, but of mud—worthless mud. In Ireland and on the Continent of Europe, turf or peat is extensively used as fuel: but coal is so abundant in the United States that there has been little demand for other sources of heat. During the great strike in Pennsylvania a year or so ago, the importance of emancipation from the coal trust was brought home; and this is emphasized by the gradually but surely advancing prices of this form of fuel. There are immense areas of peat bogs in the United States, and there is no reason why they should not be utilized.

Already, several plants for the preparation of peat have been established; one is near Ogdensburg, N. Y., and is located on a large dredge. The progress of the peat through the machine from the moment it is dug from the bog until it is delivered in the form of briquettes ready for use, is automatic. The mud is raised in buckets, dropped into the hopper of a disintegrating machine, passed through steam-jacketed pipes to drive off moisture, and then pressed into the shape of bricks. The plant is said to be operating successfully, and it is claimed that the briquettes produced here contain less than 5 per cent of moisture. This question of moisture is one of the most important yet to be solved; and another is whether it is necessary to disintegrate the peat and mold it into bricks. A company in Florida simply dumps the disintegrated peat on the ground and lets it dry in irregular masses which are later broken into lumps with hammers. This saves the ex-

pense and trouble of pressing the peat, but on the other hand its product requires more space for storage.

The advantages of briquettes are that they are clean and convenient to handle; they light easily and quickly, and burn with a clear, intense flame; they make practically no smoke, and are the cheapest form of fuel for many purposes. As already noted, they are used abroad not only for domestic heating, but for locomotive and other steam firing. Another application—and one of great importance—is for gas production. The Geological Survey has been experimenting with waste coal, coal dust, and carbonized peat, and has found that they can be made to produce an excellent gas, which, burned in an engine, produces as much net horse power per ton of fuel as the best anthracite. This means a new source of power, and at half the present cost. It may be that within a few years we shall see power plants established on the bogs of our country, converting the peat into electricity which will be transmitted to points where power is needed: thus affording another illustration of the value of something that has always been accounted waste.

Outwitting Burglars.

How to construct a safe, or the vault of a bank, that shall be safe against the depredations of scientific burglars, is the problem that confronts those in charge of depositories of money. Our forefathers were satisfied to keep their treasures in strong oaken coffers, clamped with iron. These were easily opened, however, with a saw and chisel. Then resort was had to iron boxes, which were hailed as fireproof as well as burglar proof. Faith was lost in these devices when it was found that thieves could use a tiny hand drill to cut holes around the lock in the iron door. The manufacturers then increased the thickness of doors and walls; but still the thieves broke through. Steel was introduced in place of iron, double doors, double locks, double hinges and many other interesting contrivances were provided to embarrass the persistent burglar. Special steel plates were made possessing great hardness and toughness. But it was soon discovered that a small pinch of nitroglycerin, scientifically applied and exploded, made the most approved safes obsolete.

The vault makers were now confronted by the same conditions as the armor plate manufacturers. The latter had been called upon to provide an armor plate hard enough to resist the attack of intensely hard projectiles, and yet possessing sufficient pliability to prevent it from being cracked or entirely shattered by the impact and explosion. In the case of armor plate, the problem was partly solved by taking a soft steel body and rolling down upon it at a welding heat, a face several inches thick, of high carbon steel; the idea being that the hard face would resist penetration and smash up the projectile, while the softer body would hold the hard face up to its work.

On the other hand, the vault makers

met the attack of the burglar by producing a five-ply welded plate which consists of welded layers of steel. Two of these are mild or tough steel, and the other two of hard steel, and the center is a somewhat thicker layer of tough steel.

In reply to this challenge, the inventive burglar produced a new cutting tool which was even more effective than dynamite or nitro-glycerin. It was a retort carbon, similar to those used for arc lights: a few yards of electric light wire, a pair of black eyeglasses, and a plate pierced in the middle. With this simple outfit the thief was able to cut holes through steel plates with almost as much ease as the end of a red-hot wire will pierce a piece of butter. This is the way he did it: To the nearest available electric wire he attached two wires. One of these was fastened to the safe and the other to the end of the carbon stick, suitably insulated by a wooden handle. Then, having inserted the carbon through the hole in the plate, in order to protect himself against the heat and light, the safe burglar produced a voltaic arc of immense power between the point of the carbon and the metal of the safe, melting the metal with surprising ease.

To construct something that would resist the carbon drill was the next problem; it has just been solved. The newest safety vaults are of the "battle-ship" type. They have Harveyized nickel steel armor plate walls six inches thick and 12 inch doors. The joints of the plates are dove-tailed and made additionally tight with wedging strips and key pieces so as to be proof against any attack by floating nitroglycerin. Wedges can make absolutely no impression on the joints or where the doors fit into the frame, the hard face of the steel splintering the wedges just as it does the hard point of a projectile. For the same reason the burglars' drill is useless; and as for the newest method of attack, by employing the arc light and taking the temper out of the steel, the use of the arc is made so difficult to obtain that no burglar can hope to rely on it.

Another safeguard is a sheet of tin foil with other tin foil seemingly pasted on it, the whole backed by common muslin cloth and varnished until it has about the consistency of a window shade. This would not seem a formidable obstacle; but the minute the electric burner touches the tin foil curtain a bell rings in an office several stories higher up, which tells a watcher that there is trouble.

In making this curtain, a sheet of muslin is taken and covered with sheets of tin foil, smoothly pasted down; then comes a layer of tissue paper, then strips of tin foil pasted up and down, so as to make a connected line running zigzag across the curtain. The distance between these strips is not more than three inches. The tissue paper forms an insulation between the bed of the curtain and the tin foil strips, and they in turn are insulated from outside connection. The whole is varnished. A curtain so constructed surrounds the vaults of most of the modern banks. Connected with the two layers of tin foil are the ends of an electric circuit, so that when the current is applied it will pass continuously around the vault in the inside layer of tin foil, then through a delicate resistance coil, on into the outer layer and out on the other wire leading back to the main office. Indicators with a bell attachment connect the ends of the wire to form a circuit. When the device is in operation, a current of a certain

strength is passed through the circuit, and the resistance encountered in the coil connecting the two layers places a needle on the indicator in the central office at a certain figure. If a robber tries to cut through the curtain, either the whole device will be short circuited, or the resistance coil will be cut out. In either case the needle on the indicator will show that something is wrong.

Another problem for the burglar is a remarkable lock, which has a combination consisting of four sets of letters of the alphabet, which can be set to a sentence in most modern languages. When one letter is used in one alphabet and another in the second set, it becomes a complicated affair. Then there is the question of what language it has been keyed in to be solved by the safe breaker. It remains to be seen what steps he will take to meet these new conditions.

The Strength of Agricultural Timber.

Before putting a timber into a structure every builder must know the strength of the timber and the maximum load it will have to carry. Building laws generally require that the material used shall be from three to six times as strong as is actually necessary.

Loblolly, longleaf, and Norway pines and tamarack are among the principal timbers of the eastern United States, and Douglas fir and western hemlock of the western. In the trade, loblolly pine is classed both as Virginia pine and as North Carolina pine. Virginia pine is made up principally of material from the northern part of the loblolly pine belt, and is inferior in quality to the North Carolina pine, so that the distinction is one of grade rather than one of locality. Longleaf yellow pine as known on the market may include the better grades of short leaf pine and Cuban pine. It has for a long time been the standard construction timber of the East. Norway pine, known as red pine, is lumbered principally in Michigan, Wisconsin, and Minnesota, where it is marketed with white pine as northern pine. Douglas fir, called in different localities yellow fir, red fir, Oregon pine, and Douglas spruce, is cut most extensively in Washington and Oregon. Western hemlock, which is obtained from the same region, suffers from the reputation of the eastern hemlock, but it is far superior for structural purposes. On account of the prejudice against it, it is often sold under such names as Alaska pine and Washington pine, spruce, or fir.

Recent tests by the Forest Service show longleaf pine to be the strongest and stiffest of all the timbers named, with Douglas fir a close second; while western hemlock, loblolly pine, tamarack, and Norway pine follow in the order given. Fortunately, Douglas fir and western hemlock, of which there are comparatively large supplies, have high structural merit, as has also loblolly pine, the chief tree upon which the southern lumber companies are depending for future crops.

Much of the information hitherto available concerning the strength of timber has been secured from tests of small pieces without defects. This can not safely be assumed to hold good for large-sized timbers as found on the market, since these commonly contain such defects as checks, knots, cross grain, etc. The location of the defects varies the extent to which they lessen its strength; and the proportion of heart and sap wood, and the state of seasoning, must also be considered.

Circular 115 of the Forest Service, just issued, gives the results of tests that have been conducted during the past four years at timber-testing laboratories in different parts of the country. This circular will be mailed upon application to The Forester, Forest Service, Washington, D. C.

Wanted—An Alfalfa Cultivator.

A prize has been offered by a company in South Africa for the best cultivator for lucerne, or alfalfa, sown broadcast. This crop grows freely in Cape Colony, but is practically never drilled, being usually sown broadcast. A drag implement, similar to that used for drilled crops, will not do for the broadcast alfalfa, owing to the damage done the crop in cultivation. The endeavor to secure the best cultivator has led the Cradock Agricultural Society to arrange a competition for next year, at which a prize of \$485 will be given for the most successful implement. The trial is for a "general purpose" implement to be used on alfalfa from one year old and upward, to produce a fine tilth of not less than 3 inches in depth—with the object of conserving moisture—to destroy grass and weeds, and which must leave the surface of the ground as even as it found it and in good condition for irrigation. Entries must be made by January 1, and the implements must be on the grounds appointed for the trial by February 1. The selling price at Cape ports must not exceed \$150.

The following suggestions are made as to the style of cultivator suited to the work: The machine should run on wheels, which will admit of its traveling from place to place, and have a roller or drum revolved at a rapid speed by gearing from the main or traveling wheels and fitted with long spring arms or teeth, the roller being suspended and capable of being lowered or raised by the usual lever or quadrant, so that the teeth can be lifted when traveling and lowered for shallow or deep cultivation. The chief difficulty will be in arranging so that the machine will not dig out lucerne as well as weeds. The principle will be best made clear to foundry and machine shopmen by stating that it would be the power wood molding plane adapted to cultivation, where the traveling pace of the team would represent the "feed" of the molding plane, and the drum and teeth would represent the blade holder and the revolving blade. By adjusting the proportion of the speeds of the traveling wheels and the drum, any fineness of tilth can be produced in either dry or irrigated land. It must have teeth with spring or give in them both forward and backward and also spring or give sidewise or across the machine, sufficient to admit of a tooth slipping off a large lucerne root. Straight spikes seem to be best, of spring steel, an arrow at the point, say one-half or three-fourths inch in diameter, for just such a distance as they will enter the ground, and hooked or bent only at the extreme end sufficiently to make them enter the ground without having more weight in the machine than is necessary for strength. A spring tooth or flat section, with a half turn in the middle, seems likely to give the required spring in both directions, provided the tooth is fairly long. The principles involved are embraced somewhat in an English hay-tedding machine.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,
THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

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Skirt-holder.....F. H. Newton
Sled. Perambulator.....W. Haxton
Sleeve. Split.....W. Thomas
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Steam-boiler.....E. L. Arnold
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Stovepipe-connector.....J. Haigh
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.....F. Rivett et al
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 Cultivator harrow attachment.....A. A. Yackie
 Current motor. Water.....H. W. Schmidt
 Curtain-fixture.....D. E. Bonner
 Curtain-fixture.....H. M. Sturgis
 Curtain-pole.....L. H. Pfeighardt
 Cycle. Motor and other.....J. L. Miller
 D-handle.....F. P. Maus
 Dehorner.....G. Anderson
 Derrick. Portable.....W. C. Booz
 Disk-feeding machine.....A. H. Neureuther
 Display-rack.....E. B. Martin
 Display-rack.....F. H. Corwin
 Diver's helmet.....P. Hansen
 Domestic boiler.....P. Rahm
 Door.....F. A. Lang
 Door-check.....J. V. Edgcomb

Door-hanger and roller-support for edgewise movable doors.....D. Schuyler
 Draft-regulator. Automatic.....S. W. Salmon
 Draft-rigging.....G. L. Harvey
 Dredging-machine.....G. M. Brown
 Dress-case.....E. H. L. Wallace
 Dress-shield.....M. H. McManis
 Drinking-fountain.....J. F. Tannehill
 Drumhead.....I. H. Sapp
 Dye and making same. Halogenated red vat.....G. Engi
 Dye and making same. Red-violet vat.....A. Schmidt et al
 Dye. Making a halogenated red.....G. Engi
 Egg-boiler. Automatic.....C. B. Martin
 Electric conductor.....W. Hoopes et al
 Electric conductors. Making.....W. Hoopes et al
 Electric controlling mechanism. Thermopneumatic.....H. C. Smith
 Electrical condenser.....L. Gerard
 Electrolyzer-hanger.....R. T. Watt
 Elevating device.....P. Burnah
 Elevator-door lock.....G. R. Wikander
 Engine igniter. Internal-combustion.....F. E. Ream
 Engine igniting means. Explosive.....R. Botkowski
 Engine regulating apparatus. Internal-combustion.....J. E. Aue
 Engines-starter. 2 pats.....C. J. Coleman
 Engines-starter. Automatic.....C. J. Coleman
 Engines. Automatic stopping device for internal-combustion.....D. B. Adams
 Explosive-engine. Revolving-piston.....A. Bayer
 Eyeglasses.....W. L. Breach
 Fan. Electric.....O. Selg
 Fan and pump wheel. Centrifugal.....G. M. Capell
 Fan. Electric.....F. Dicht et al
 Fare and distance indicators. Means for operating.....O. Kunzen
 Fare indicator.....B. Schneider
 Farinologist.....W. I. Olm
 Fence-protector.....G. H. Korner
 Fence.....C. J. Saunders
 File-pocket. Vertical.....A. Bushnell, Jr.
 Filter.....G. Knock
 Filters. Packing.....G. Knock
 Fire-alarm. Automatic.....C. Smith
 Fire-escape.....J. Wenig
 Firearm.....T. M. Thorsen
 Fireproof window.....S. H. Pomeroy
 Floor surfacing machine.....W. L. Taft et al
 Flooring and making the same.....G. H. Bennett
 Fuel and making the same. Artificial.....D. Drawbaugh et al
 Furnace.....A. W. Blanchard
 Game apparatus.....J. B. Fry
 Game apparatus.....G. S. Parker
 Garment-fastener.....F. G. Wright
 Garment-hanger.....J. E. Williams
 Gas-burner. Incandescent.....R. N. Oakman
 Gas-burners. Pneumatic valve-controlling apparatus for.....R. N. Oakman
 Gas-burning air-heating furnace.....V. W. Blanchard
 Gas in mains. Means for ascertaining the temperature of illuminating.....C. O. Bond et al
 Gas-meter. Rotary. 2 pats.....T. Thorp
 Gases in pipe-conduits. Apparatus for obtaining a uniform rate of flow of.....T. Thorp
 Glass having surface projections. Manufacture of.....F. L. O. Wadsworth
 Go-cart.....E. C. Moore
 Governor.....C. R. Lanphear
 Grain cleaner and separator.....W. C. Harmon
 Graphophone sound-reproducer.....W. Hart
 Grate. Tubular.....E. Kyllonen
 Grater.....H. Van der Voort
 Gun-layers in pointing guns. Apparatus for instructing.....R. D. White
 Guns. Single-trigger mechanism for double-barreled.....O. W. Brenizer
 Harrow.....J. H. Johnson
 Harvesting and husking machine. Corn.....W. B. Metcalf
 Hat-guard.....A. Fomander
 Hay-carrier.....D. M. Motherwell
 Heat-transferring apparatus.....V. Croizat
 Heater.....W. S. Turney
 Heating device.....S. Z. de Frenant
 Heel. Boot and shoe.....F. Bostock
 Hinge.....G. C. Witt
 Hinge. Double-acting.....J. J. Cowell
 Hook.....J. Krimer
 Humidifier.....C. E. Whitmore
 Index system. Card. 2 pats.....W. M. Stretch
 Induction-coil apparatus.....E. C. Wilcox
 Inhaler.....J. H. McCulloch
 Insulator.....J. C. Barelay
 Internal-combustion engine.....C. H. T. Alston
 Ironing table.....J. Garret
 Jar-cap (reissue).....E. I. Smith
 Jars, bottles, and like receptacles. Closure for.....M. D. Converse
 Journal-box.....S. Hicks
 Kinetoscope.....F. Spanning et al
 Knitting-machine. Circular independent needle.....H. Stoll, Jr.
 Knob. Kettle-cover.....E. A. Sawyer
 Knobbling-furnace.....W. F. Westlund
 Lamp-shade.....W. J. Roosen
 Lard-press.....E. A. Sprout
 Lath-tool.....W. Collins
 Lath-tool and holder.....B. A. Hemenway
 Lifting-jack.....G. R. Booth
 Liquid-distributing means.....E. J. Moore
 Lock and latch. Combined.....J. W. Lindsay
 Lock-protecting device.....F. Dueterwald
 Locomotive-cab ventilator.....R. Burns
 Loom-shuttle.....F. A. Mills
 Loom starting and stopping mechanism.....G. B. Ambler
 Looms for weaving. Warp stop-motion for.....F. Pick
 Magnetic separator.....J. B. McCabe
 Mail-crane.....D. J. Berthold
 Mailing-card. Return.....G. H. Seragg
 Marking-gage.....A. Solomon
 Measuring-pole. Extensible.....J. Edwards
 Mechanical motion.....H. A. Ballard
 Mechanical movement.....W. B. Norton
 Melting-furnace.....T. D. Bausher
 Milk. &c. Apparatus for concentrating.....C. H. Campbell
 Mines. &c. System for ventilating.....G. M. Capell
 Miter-box.....W. M. Potter
 Mortise-case.....F. Egge
 Motor.....K. F. Erickson
 Organ stop-action. Combination.....J. E. Philie
 Oscillation-detector.....L. De Forest

Oscillation-responsive device.....L. De Forest
 Oscillations. Detecting.....L. De Forest
 Phonographs. Friction reproducing attachment for.....A. N. Pierman
 Piano. Automatic.....J. W. Darley, Jr.
 Piano. Automatic grand.....J. H. Sandias et al
 Pipe-iron. Treating.....G. S. Page
 Pipe.....L. Underwood
 Pipe-cleaner.....M. E. Kanaly
 Pipe-coupling.....E. S. Williamson
 Pipe-hanger.....M. Schang
 Pipe or hose coupling.....J. H. Phillips, Jr.
 Pitch substitute and making the same.....K. Ruecker
 Planter.....I. A. Weaver
 Plow.....E. J. Ingram
 Plug-in switch.....H. D. Murdock
 Pneumatic suspension means.....J. H. Clark
 Polishing-machine.....P. H. Barz
 Printing machine. Automatic plate.....T. R. and J. H. Demery
 Printing-press.....J. F. Ames
 Printing-press.....T. A. Needham
 Printing-press feed and delivery mechanism. Automatic.....S. C. Beale
 Printing-presses. Printed-sheet-receiving table for.....F. W. Thomas
 Propeller.....O. Peterson
 Propeller. Screw.....D. W. Taylor
 Pump.....S. G. Skinner
 Pump.....R. H. Stoker
 Pump and similar apparatus. Force.....J. Weeks
 Pump valve. Direct-acting steam.....W. Weir
 Puzzle.....J. H. Savidge
 Quilling-machine stop-motion.....D. Lawlor
 Rail-joint.....J. J. Herndon
 Railway-switch. Electrically-operated.....F. J. Johns
 Rake and baling-press. Combined.....P. E. Day
 Range. Gas.....W. A. Mills
 Ratchet-wrench.....A. E. Smith
 Rope carrier. Fall.....J. G. Delaney et al
 Rotary expansion-engine.....E. Horn
 Rowlock.....B. F. Tripp
 Rubber overshoe.....F. C. Hood
 Rubber substitute and making the same. Hard.....C. Marter
 Rule.....H. Jeffreys
 Sash-lock.....H. Buttress
 Saw-filing device.....W. M. Potter
 Saw-set.....W. Carner
 Sewing machine.....H. W. Cotton
 Scale.....D. J. Holliger
 Scale. Computing.....O. O. Ozias et al
 Scissors or shears.....T. S. Sayre
 Screw-clamp.....J. L. Taylor
 Seal.....F. V. Brooks
 Seal. Bottles. 3 pats.....L. Bartlett
 Sewing-implement holder.....H. A. Lee
 Shade-bracket.....W. A. Bennett
 Sharpening machine. Saw-tooth.....J. P. Hedstrom
 Sheaves. Preparing stalks of grain for forming.....M. Rice
 Shock-loader.....D. W. Kemp
 Sifter. Ash.....A. M. Nelson
 Sign. Electric.....W. A. F. Becker
 Skin-treating apparatus.....W. R. Smith
 Skins. &c. Apparatus for drying.....W. R. Smith
 Slack-adjuster.....A. Parker-Smith
 Slack-adjuster. 3 pats.....W. H. Sauvage
 Slicing-machine.....E. A. Seaburg
 Small-arm attachment.....H. B. Hollifield
 Smoking-pipe.....P. F. McClure
 Snap-fastener.....W. C. Stiles
 Sound-reproducing instruments. Trumpet or horn of.....R. Revell
 Spigot. Metal-coated.....H. Auchu
 Splitting-machine.....C. Eitel
 Spoke-tightening device.....J. L. Delhomme
 Spraying apparatus.....R. Ditchfield
 Square. Try.....F. B. Miller
 Stacks. Attachment to elbows of wind.....S. W. Erickson
 Stage illusions. Means for producing.....H. Goldin
 Steam. Apparatus for separating oil and water from.....D. B. Morison
 Steam-generator.....C. Bakehaus
 Steam-trap.....W. C. Brown
 Steel. Alloy.....J. Churchward
 Steering-wheel muff.....W. H. Handeville
 Steniling-machine.....W. G. Fuerth
 Sterilizing closed vessels.....L. Nathan
 Stop-motion. Electric.....F. A. Stanford
 Store-service apparatus.....H. J. Davis et al
 Stove.....J. E. Rockey
 Stove and apparatus for heating air.....S. C. Davidson
 Stove and radiator. Gas.....F. De Grauwe
 Surgical-instrument holder.....M. P. Hermann
 Suspender-rod.....H. Weiss
 Switch-box.....H. J. Warth
 Switch safety device. Point.....L. Dunn
 Synchronizing means. Space electromechanical.....A. H. Stewart
 T-pipe.....W. H. Bellmaine
 Table-rack and exhibitor.....M. H. Keating
 Talking-machine attachment.....A. D. Weaver et al
 Tank-emptying apparatus. Liquid.....S. W. Miller
 Tape-applying machine.....J. Dreyfuss
 Tapping mechanism.....T. G. Morse
 Telegraph-transmitter.....J. C. Barclay
 Telephone system.....F. E. Mayberry
 Threshing-machine feeder.....D. McIvor
 Tie-rod.....L. W. Noyes
 Tile. Illuminating.....J. B. French
 Tire. Automobile.....G. G. Sullivan
 Tire-covering.....G. R. Eukers et al
 Tire. Elastic.....J. W. Rock
 Tire. Vehicle.....A. D. Ray
 Toggle-bolt.....J. H. Cook
 Tool. Pneumatic.....F. M. Tobin
 Torpedo-placer. Railway.....W. C. Beckwith
 Tow. Treating fibrous.....M. H. Colahan
 Trace-holder.....W. L. Richardson
 Traction-machine.....G. W. McGill
 Trap.....G. W. Leavenworth
 Trousers. Means to press creases in.....N. M. Court
 Truck and step-ladder. Combination.....J. E. Randall
 Truck. Locomotive.....W. Pervenko
 Tubes. Manufacture of.....W. J. Still
 Turbine.....N. Baashuus
 Turbine.....M. Hachberlin
 Turbine. Steam.....H. Schulz
 Twist-drill.....G. I. Bragg
 Twisting together the filaments of a thread of artificial silk. Machine for.....M. Waddell
 Type-writer.....L. R. Roberts

Type-matrices and types. Justifying mechanism for.....E. V. Beals
 Type-writer.....E. V. Beals
 Type-writing machine.....W. E. Mason
 Valve.....D. J. Galbraith
 Valve and meter. Combination.....E. J. Moore
 Valve controller for hydrocarbon-engines. Fuel.....W. F. Rotbe
 Valve. Faucet.....L. M. Hooper
 Valve. Flush.....G. B. Gaylord
 Valve for compressors and the like. Self-acting.....F. Strnad
 Valve for explosive-engines.....J. S. Elverson
 Valve for gas-compressors. Discharge.....A. F. Clarke
 Valve for internal-combustion engines. Piston.....H. W. Adams
 Vault. Burial.....A. E. Eritiz
 Vehicle-steering mechanism. Automatic.....W. H. Strickler
 Venting-tool.....A. C. Pearce
 Vessel-hull.....S. Golden
 Wardrobe-rack. Collapsible.....F. J. Bast
 Washboard.....G. C. Haysler
 Washing-machine.....J. F. Wade
 Watch-barrel.....T. S. Bindschedler
 Watch-guard.....H. N. Bolton
 Water-heater. Electric.....M. W. Willson
 Water-motor.....C. M. Gorton
 Weighing-machine. Automatic.....J. H. McLeod
 Welding copper.....W. A. Barnes
 Well-packer.....W. W. Lewin
 Wheel.....B. C. Seaton
 Wheel.....W. Eichers
 Wheel clamp or anchor.....M. Paulson
 Wheel rim and tire construction. Vehicle.....M. P. Morrison
 Wind instruments. Reed-protector for.....E. Nelson
 Wire-holder.....N. L. Wine
 Wireless transmission of sonorous vibrations. 2 pats.....F. J. McCarty

DESIGNS.

Badge.....P. A. Mandabach
 Bag. Hand.....L. Hauser
 Comb. 6 pats.....J. Wilcox
 Knitted fabric.....J. J. Curry
 Reflector. Electric-light.....A. D. Curtis
 Spoons, forks, or similar articles. Handle for.....G. L. Crowell, Jr.
 Spoons, forks, or similar articles. Handle for.....J. E. Straker, Jr.
 Type. Font of.....C. W. Smith

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MECHANICAL PATENTS.

Abrading device.....J. R. Scott
 Accounting appliance. Credit.....R. D. Pardee
 Acid. Making lactic.....J. A. Just
 Advertising device.....H. W. Gardner
 Air-brake system.....H. N. Ransom
 Air-brake system.....C. E. Barry
 Air-ship.....M. Schiavone
 Album. Card.....H. D. Lentz
 Alcohol and obtaining the same from carboxylic compounds.....L. Bouvalet et al
 Aldehydes and solutions thereof. Making.....H. S. Blackmore
 Alloys by heating and chilling. Improving aluminum.....F. G. A. Wilm
 Ammunition wagon or caisson.....C. P. E. Schneider et al
 Amusement device.....O. M. Stewart et al
 Animal. Mechanical.....J. Hubsch
 Animal-trap.....J. W. Jones
 Annealing or heating of metals.....D. Bates et al
 Audiphone.....J. A. Baker
 Automobile.....E. W. Roberts
 Automobile-fender. Reversible.....L. P. Barrett
 Awning.....F. Thoms
 Axle. Car.....L. Hall
 Bag-holder.....J. Hulbert
 Bag-holder.....E. Taylor
 Bake-pan.....M. A. Wilcox
 Baking-pan.....C. E. Pierce
 Baling-press.....J. J. Stoppel
 Band-cutter and feeder.....W. E. Donner
 Bearings. Cage for rolls in roller.....C. S. Lockwood
 Bedclothes-supporting device.....E. L. Tyrrell
 Beet-topper.....D. T. Blevins et al
 Belt guide and shifter.....R. E. Horinek
 Berth and seat for passenger-carriages. Combined.....D. T. Owen
 Bicycle-guard.....J. B. Lockwood
 Bicycle propelling mechanism.....H. S. Corbitt
 Bicycle. Water.....J. Heggen
 Billiard-cue-chalking device.....R. E. Gunsolus
 Binder. Loose-leaf.....R. B. Wilson
 Binder. Loose-leaf.....H. Schneller et al
 Boiler compound.....J. Williams, Jr.
 Boiler-flue cleaner.....W. J. Bradley
 Boilers. Steam ash-remover for.....J. A. Kretzer
 Book-mark.....J. F. Orgatz
 Books, tablets, &c. Backing-machine for.....J. G. Klink
 Boot and shoe. Composite.....H. C. Richardson
 Boot and shoe finishing machines. Rotary operating member for.....W. W. Crooker
 Bottle.....C. B. Wiltse
 Bottle closure and seal.....C. Schöbert et al
 Box-lid fastening.....J. W. Evans
 Brake-head. Adjustable.....C. E. Bauer et al
 Breaching device.....T. B. Bradford
 Brick-machine.....F. Mueller
 Brick-machine.....B. C. White
 Bridle. Bitless.....H. J. Van et al
 Brooder.....J. Goetze
 Brush-holder.....F. P. McBerty
 Brush-manufacturing apparatus.....H. Weihermüller
 Bucket and cooker. Combined.....M. M. Mauck
 Bucket and similar vessel. Milk.....S. E. Bell
 Bucket. Turbine.....W. L. R. Emmet
 Buckle. Cross-line.....F. W. Dill et al
 Building-block.....J. C. Gieck
 Burglar-alarm.....H. K. Geiger
 Burglar-alarm and sash-lock. Combined.....J. W. Carpenter
 Butter-cutter.....A. C. Hummer
 Button and necktie-holder. Combined collar.....F. D'Aversa et al
 Cable-hanger.....A. A. Walsh
 Cables, pipes, rods, and the like, and in a flux therefor. Jointing of.....S. L. Smith et al

Signal system.....J. A. Gehrung
Signature-gathering machine.....W. I. Lewis
Skirt-protecting garment.....F. N. Cartwright
Sled. Coasting.....C. M. Thomas
Smoking-pipe.....E. Shoner
Soap. Resin.....E. Fischer
Soap-shaver.....J. V. Irenius
Soda-water-dispensing apparatus. Automatic.....H. Blum
Sound-conveying device.....E. H. Mobley
Sound-records. Making molded flat.....W. H. Hoyt
Spark-arrester.....C. H. d'La Monte
Speed-recorder.....C. E. Glessner
Speed-regulator.....H. Spence
Spindle.....J. C. Scott
Spinning and doubling frame.....H. B. Reynolds
Spinning-machine thread-guide.....J. E. Prest
Spoil heaps, banks, &c. Means or apparatus for the formation of.....J. P. Roe
Spoke-socket.....W. E. Holt
Spring.....F. P. D'Arcy
Sprinkler-head.....A. M. Lewis
Sprinkler-head deflector. Automatic.....J. C. Scott
Sprinkler system. Automatic.....W. Bauer
Sprocket wheel and chain.....R. S. McIntyre
Square. Carpenters.....J. G. Feil
Stacker-section and the like. Hinge for.....S. J. Heitzenrater
Stair.....S. Grossman
Standard-fastener.....H. A. Palmer
Stay. Garment.....D. Schuler
Steam-boiler.....A. E. Jones
Steam-separator.....J. B. Berryman
Steam-separator.....W. W. Doolittle
Steel. Alloyed.....J. Churchward
Steel tie. Hollow.....H. E. McMullen
Steering apparatus. Hydraulic.....H. S. De Puy
Stoker.....C. A. Knowlton
Stone-tilting machine.....G. N. Williams, Jr.
Stool. Metallic.....C. H. Erickson
Stove. Electric igniter for gas.....A. M. Turkington
Stuffing-box.....J. R. Beam
Stump-puller.....B. L. Groth
Submerged objects. Apparatus for locating.....S. Lake
Sugar. Obtaining milk.....J. A. Just
Surgeon's operating-pan.....C. S. Shriver
Swimming-paddle.....J. E. Schnopp
Syringe nozzle. Vaginal.....S. L. Kistler
Table. And pencil-holder.....A. D. and A. B. George
Tailor's dummy.....J. Ramb
Tamping-bag.....E. W. Wheeler
Tank float. Flushing.....W. Heap
Tap for liquid-receiving vessels. Filling.....C. J. Coleman
Tapping device. Barrel.....A. W. Doremus
Tar from gaseous products of dry distillation for the purpose of producing acetate solutions. Eliminating.....M. Klar
Teeth. Making artificial.....J. Morris
Telegraphic instrument.....J. P. Zelenka
Telephone attachment.....J. A. Gordon
Telephone attachment. Party-line.....J. H. Blythe
Thawing-furnace.....T. D. Bausher
Thermoset.....J. Homan
Thermodynamic appliance.....G. W. Wacker
Thiosamin compound.....F. Mendel
Ticket-cutter.....W. Kinkad et al
Tile. Drain.....W. H. Carson
Tiles and other articles. Machine for grinding and finishing.....W. T. Nicholls
Tiles. Making.....C. H. Geanakopulos
Tire-armo.....C. P. Mays
Tire. Cushion.....W. D. McNaul
Tire. Wheel.....H. B. Ewbank, Jr.
Tool. Combination.....M. Hunt
Tool-holder.....E. Mueller
Torpedoes on vessels. Means for carrying and handling.....T. J. Moriarty
Toy.....H. P. Wysard
Tripod for music-stands and the like.....C. H. French
Truck. Binder.....H. O. Steinhauer
Truck-bolster.....C. E. Bauer
Truck. Car.....A. E. E. Norwich
Tube to be welded. Apparatus for grasping the skelp of a.....A. Iwer
Tunnel-kiln.....P. L. Youngren
Turbine.....J. Hutchings
Turbine. Elastic-fluid.....O. Junggren
Turbine regulator. Steam.....E. C. Crocker
Turbine. Steam.....R. Schulz
Turning-machine.....J. J. Biard
Tympan-bale.....J. C. A. Anderson
Type-writer.....C. Gibbs (Reissue)
Type-writing machine.....F. X. Wagner
Type-writing machine.....J. F. Forkarth
Type-writing machine.....G. A. Seib
Type-writing machines. Type-bar action for.....J. W. Kennedy
Umbrella.....C. A. Bosel
Umbrella.....D. Lippy
Umbrella-fastener.....C. L. Schmidt
Umbrella. Folding.....J. Casale
Universal wrench.....M. Korth
Vacuum-pan.....P. G. Kaiser
Valve.....J. R. Tanner et al
Valve.....P. Allen
Valve. Ammonia expansion.....C. F. Strang
Valve. Automatic flush.....P. W. Landell
Valve. Automatic flush.....J. B. Williams et al
Valve. Combination.....R. C. Frampton
Valve for water-jackets. Safety.....O. H. Shafer
Valve. Gate.....A. P. Smith
Valve. Gate.....W. W. Doolittle
Valve-gear.....S. W. Long
Valve-gear for explosive-engines.....H. Tabor
Valve mechanism. Automatic.....E. D. Ackerman et al
Valve. Pressure-reducing.....C. J. Coleman
Vegetable-disintegrator.....C. Hoover
Vehicle booster-plate.....I. Broadhead
Vehicle brake.....J. G. Ebnen
Vehicle controller. Motor.....C. E. Fear
Vehicle-curtain fastener.....F. A. Neider
Vehicle running-gear.....F. Schmidt
Vehicle-wheel.....G. S. Whiteley
Vehicle-wheel.....W. J. and J. R. Mitchell
Vehicles. Device for preventing slipping of motor-driven.....A. S. Moore
Vehicles. Short-turning gear for.....L. C. Marr

Vending-machine.....R. Weitlich et al
Vessel. Apparatus for taking observation from a submarine.....S. Lake
Vessels. Means and apparatus for raising sunken.....S. Lake
Vessels. Water-alarm apparatus for.....F. Daniel
Veterinary obstetrical instrument.....M. G. Sisler
Violin-bow.....J. Doster
Voting-machine.....G. C. Ale
Voting-machine.....W. B. Norton
Wagon. Chute.....F. M. Krasner
Wagon side step.....J. C. Oliva
Wainscoting.....S. F. Williamson
Wall construction.....G. E. Davis
Warping-machine.....C. H. Knapp
Washbowl.....J. P. Dorau
Washing-machine.....G. Roberts
Washing-machine.....D. Rowland
Washing machine.....A. Erler
Water and other liquid purifying apparatus.....P. G. Griffith
Water-closet seat.....J. A. Lund
Water-cooling apparatus.....W. A. Hyed
Water-elevating apparatus.....G. W. Rosengarten
Water-heater.....J. H. Boyes
Water-pressure regulator.....J. M. Pietzuch et al
Water-tube boiler.....D. M. Webster
Water-tube boiler and steam generator.....D. Roberts
Waterway-gate.....D. W. Ross
Wave-motor.....D. N. Green
Wax-holder.....M. E. Parker
Wax.....G. F. Brandenburg
Wheel-shaping machine. Revel.....T. Coventry
Wheelbarrow.....L. F. Lorenzi
Willow-stripper.....G. S. Herrick et al
Wind-power apparatus.....R. Stola
Windmill.....I. Miles
Window-frames. Split drum for.....R. Rivett et al
Window-catch.....C. Tong
Window-opener.....J. H. Cartland et al
Wire fabric.....A. F. Backlin
Wire-splicer.....G. H. Goughnour
Wire-support.....L. Steinerger
Wrapping and addressing machine.....S. E. Farnham
Wrench.....H. Fisher
Wrench.....L. Hermand
Wrench.....D. J. Dawson et al

DESIGNS.

Car-body.....W. R. McKen, Jr.
Jar. Pottery, 2 pats.....E. S. Smithson
Ly e-writer ribbons and tension-bands. Spool for.....J. Alexander

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MECHANICAL PATENTS.

Abrading or cutting tools. Driving mechanism for machines for operating.....C. J. Fancher
Acid and making the same. Para-aminodiphenylamin sulfonic.....F. Erdmann
Acid. Producing sulfuric.....I. Kitsee
Adding-machine.....B. Hoskins
Adhesive material. Vessel for.....W. H. Reddington
Agricultural implements. Shift mechanism for.....P. Mcagher
Air-motor.....P. Kiefer
Alkaline chlorid. Electrolysis of fused.....F. von Kugelgen et al
Alternator. Compounded self-excited.....M. C. A. Latour
Alternator. Shunt-wound self-excited.....M. C. A. Latour
Ammonia from distillers' washes. Recovery of.....J. Effront
Amusement device.....J. D. Vasey
Amusement device.....H. C. Hebig
Amusement device. Submarine.....D. E. Washington
Animal-trap.....T. H. Donlon
Ash barrel or can.....J. D. Hewitt
Automobile-locking mechanism.....J. F. Colman
Automobile transmission-gearing.....J. W. Lambert
Automobile vehicle.....J. M. M. Truffault
Automobiles and the like. Means for heating.....C. H. Foster
Axle box. Car.....H. C. McCarty
Bales. Means for changing the shape of and compressing.....S. J. Webb
Band-cutter and feeder.....W. A. True
Barrel.....F. E. Lowy
Barrel-assembling machine.....O. Schimansky
Beading or molding tool.....A. Pellrin
Bearing. Roller.....F. Stratton
Bed bottom.....J. O. Wesner
Bell and speaking-tube.....R. W. Lyon
Revel-polishing machine.....H. Lohmann
Bicycle.....G. J. Hamacher
Bicycle-brake.....G. Kukovac
Binder.....F. B. Jordan
Binder. Loose-leaf.....L. M. Morden
Binder sails or fans. Operating mechanism for.....T. Lait
Bit-holder.....L. Ruegg
Blind-stop.....L. M. Koenig
Blue-printing machine.....L. M. Ra h
Boat-cleat. Yielding.....F. A. Bierie
Boiler safety device. Steam.....C. Letteri
Bomb for use in metallurgical operations.....J. O. Bardill
Book. Manifolding sales.....H. P. Brown
Book or music leaf turner.....H. Alrich
Bookbinder.....D. H. York
Boots and shoes and the like. Apparatus for applying wax to.....G. H. Harlow
Bottle attachment.....G. T. Thommd
Bottle. Non-refillable.....C. H. Stone
Bottle-stopper.....G. Hookham
Bottle-top.....W. S. Ayling
Bottles or the like. Cork for stoppering.....H. W. Dawson
Box.....J. C. Barry
Bracelet-joint.....N. C. Wallentin
Brake mechanism.....P. X. Beaulieu
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Bridge-whist apparatus.....F. B. Hurd
Broiler. Gas.....J. A. Barrett
Brush. Pneumatic.....J. E. Schadle
Buckle.....A. F. P. Stenzy
Buggies. Side-track draft attachment for.....W. Grono

Burner.....T. J. McGee et al
Button. Collar.....F. D. Small
Button. Fastening.....P. MacGregor
Calendar.....H. A. Marshman
Calipers.....A. Thomsen
Can-capping machine.....E. J. Judge
Can-closure.....E. Eckart
Can-closure.....J. A. Fleming
Can-head-cutting machine.....M. J. Ferren
Can-lifter.....C. F. Alline
Cans. Closing.....J. Dieckmann
Canopies, awnings, &c. Supporting-frame for.....R. A. Cox
Car brake-beam. Railway.....S. A. Crone
Car brake. Railway, 3 pats.....S. A. Crone
Car-coupling.....W. Schurr
Car-door lock. Sliding.....F. C. Hodgdon
Car-fender.....H. C. Jordan
Car fender. Street.....C. O. Conner
Car. Railway.....G. T. Martin et al
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Car-seat.....H. Witte
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Cars. Means for varying the force of counter-weights for hoisting skip.....A. E. Brown
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Carbureter.....W. C. Schneider
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Card. Transparent-faced filing.....J. A. Bexell
Carding-machine.....C. I. King
Carpet-cleaner.....E. T. Williams
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Cartridge.....C. A. Bailey
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Castings. Internal-chilling apparatus for hollow.....J. Butler
Catch-basins. Receiving-head for.....A. W. Kurz
Chair.....R. S. Buch
Chair with extensible foot-rest.....W. T. Armstrong
Checkrein device. Fielding.....W. J. Armstrong
Cheese-cutter.....C. M. Hansan
C. rome-yellow. Manufacture of.....P. D. Potter
Churn.....A. O. Martin
Clay-cutter.....T. Major
Clock. Self-winding electric.....A. F. Poole
Clocks and the like. Motion-work for.....H. V. Knight
Cloth splitting and rewinding machine.....S. B. Cohen
Cock. Stop.....J. B. Bell
Cock. Time-controlled gas.....H. W. Harris
Coil. Variable reactive.....R. E. Barker
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Collar and cuff. Lady's.....G. S. Cox
Colors. Making phosphorescent.....W. J. Hamner
Compasses. Drafting.....J. D. Ward
Composite pipe.....E. M. Johnson
Computing machines and the like. Tabulating attachment for.....D. W. Shick
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Concrete building-block.....H. S. Brewington
Concrete. Manufacturing.....W. D. Crow
Concrete structure. Reinforced.....G. M. Graham
Concrete-wall mold.....M. J. Demorest
Corn-separator.....W. A. Werckle
Corncuts, &c. Water-trap for.....J. H. Viol
Corset-stay.....J. R. Dean
Couch. Suspension.....J. B. Patterson
Crate. Banana.....A. Lombardo
Crate. Collapsible.....P. E. Boyd
Crate. Shipping merchandise.....S. Giwowsky
Crutch.....W. Autenrieth
Curtain-ixture.....D. E. Bonner
Curtain-pole attachment.....W. J. Adenhardt
Curtain-stretcher.....M. A. Smith
Curtains. Machine for cutting flexible roll.....J. Gramelspacher
Curved surfaces. Adjustable form for.....J. E. Wood
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Cutting-tool.....J. Cryer
Dam-gates. Device for hoisting and dropping.....W. Moriarty
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Dental plate.....G. W. Morgan
Dental work. Crown-pin for.....H. D. Bultman
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Display-stand.....A. E. Brown
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Door fastener. Sliding.....R. T. Stone
Doors. Control of motor-operated.....D. W. Taylor
Draft-equalizer.....O. Holm
Draft-rigging.....W. L. De Remer
Dredging apparatus.....T. R. Goth
Dust-pan.....W. R. Rich
Dust-pan and crumb-tray. Dust-proof.....L. Prideaux
Dyeing yarn-cops. Apparatus for.....J. F. Roberts
Dynamo. Self-exciting alternating-current.....M. Latour
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Egg-wrapper.....M. E. Brown
Eggs and other commodities. Mechanism for dispensing.....G. A. Almstrom et al
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Electric controlling system.....K. P. Jackson
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Electric machine. Dynamo.....M. Pfatischer
Electric motor.....O. H. and A. F. Pieper
Electric switch.....C. S. Hill
Electrical connector.....F. H. Ayer
Electrolytic metallic deposits. Bath for obtaining.....L. Trunkhahn
Electropneumatic channeler.....A. H. Gibson (Reissue)
Elevator plants. Means for operating hydraulic.....R. C. Smith
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Envelop.....W. S. Brown
Envelop.....H. Heffner
Envelop. Post-card.....J. G. Peppeler
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Excavators. Boom and rotatable circle for.....J. P. Karr et al
Explosive.....J. B. Braunstein
Explosive-engine.....H. M. Neer
Explosive-engine.....W. K. Bassford
Explosive-engine.....M. Fischer
Explosive. Nitro-starch, 5 pats.....J. B. Braunstein

Explosives. Electric ignition of.....O. J. and A. M. Lodge
Explosives. Priming of.....L. Lheure
Eyebolt bending and swaging machine.....W. G. Shults
Fare-indicator, 2 pats.....H. Dünhölder
Fare-indicators. Transmission-gear for.....H. Dünhölder
Fastening device.....C. E. Cashmore
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Fence-clamping device. Wire.....J. A. Clements
Fence-tie.....E. J. Bowerfind
Fencing fastener for concrete posts. Wire.....E. U. Down
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Fiber-cleaning machine.....C. G. Sargent
Fig-bars and similar articles. Machine for cutting.....A. S. Cairneross
Filament and process. Incandescent.....E. McOuat et al
Filament for incandescent lamps.....E. McOuat et al
File. Bill.....R. Rubens
Filing system.....J. A. Bexell
Filter. Water.....J. E. Young
Filtering apparatus.....M. B. Lukens
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Fire-escape.....R. Zube
Fire-shield.....J. W. Hull, Sr.
Firearms and cannon with deepened grooves. Barrel for portable.....C. Puff
Fitting and clean-out. Testing.....P. J. McGinn
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Flume-gate.....F. M. Huntton
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Gas-generator.....A. Davis et al
Gas generator. Acetylene.....C. W. Holm
Gas generators. Carbide-feeding device for acetylene.....A. Davis
Gas. Making.....D. A. Short
Gas-retort charging and discharging apparatus.....W. W. Fiddes et al
Gases. Means for producing and distributing combustible.....M. V. Smith
Gearing. Transmission.....R. M. G. Phillips
Gin-cylinder.....C. B. P. Carver
Glass. Method and machine for making wire.....A. Shuman
Golf-club.....D. Myles
Governor.....H. F. Ammermann et al
Governor. Centrifugal.....V. G. Apple
Grain-tally.....H. H. Warren
Grate. Rocking.....G. C. Andrews
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Handle-support.....I. J. Knapp
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Harvesters. Grain-lifting device for.....B. Curl et al
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Heating system. Low-pressure fluid.....E. H. Gold
Heating systems. Expansion device for hot-water.....M. C. Honeywell
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Hinge. Self-closing.....G. A. Datscheg
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Hub-wrench.....E. G. O'Donnell
Hydrant.....F. G. Midgett
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Impregnating-tanks. Tie-car for.....T. H. Stagg et al
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Indicator safety device.....I. L. Kiser et al
Indigo, &c. Making.....H. Belart
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Insulator. Clamp.....G. Pollock et al
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Internal-combustion engine.....O. Roberts
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Liquid-tray.....M. Goldfein
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 Lock.....P. H. J. and P. Krulder, Jr.
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 Nickel from ore. Recovery of
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 Nut-lock.....J. F. Sandrock et al
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 Post-protector.....T. B. White
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 Powder. Semismokeless.....G. W. Gentieu
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 Printing-machine.....J. L. Firm
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 Printing-press cutting and folding device
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 Pump. Rotary.....R. M. Blackmer
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F. C. Ziemsen
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 Turbine. Elastic-fluid.....O. Junggren
 Turbine. Steam.....H. G. Robinson
 Turbines. System of lubrication for elastic-
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H. F. Nichols
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J. H. Stanfield
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G. Wamhoff, Jr.
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 Window-dressing device.....F. T. O'Kane
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J. A. Clements
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 Wrench.....C. L. Henderson
 Wrench.....W. H. Whittemore
 Wrench.....D. Mandl
 Wrench.....H. C. Clark
 Wrench.....J. H. Mills

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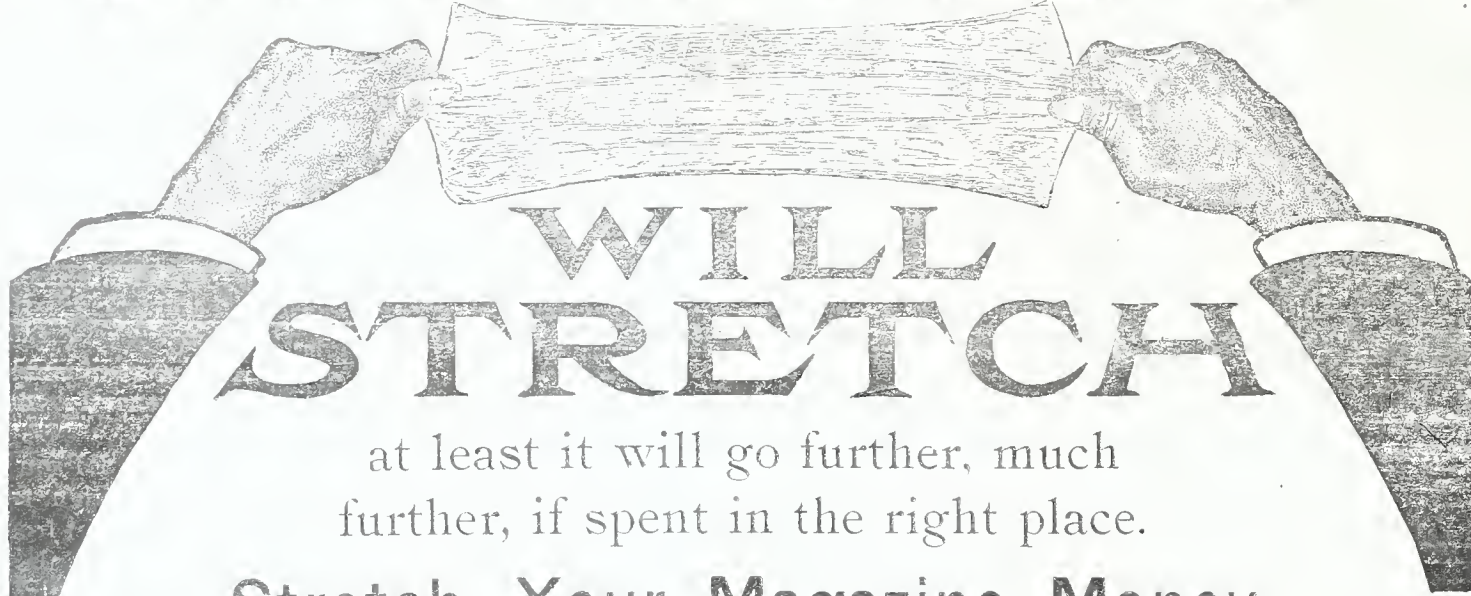
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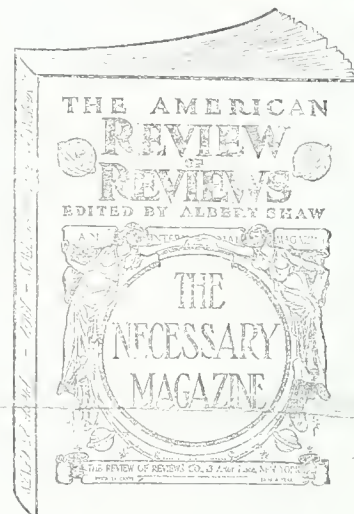
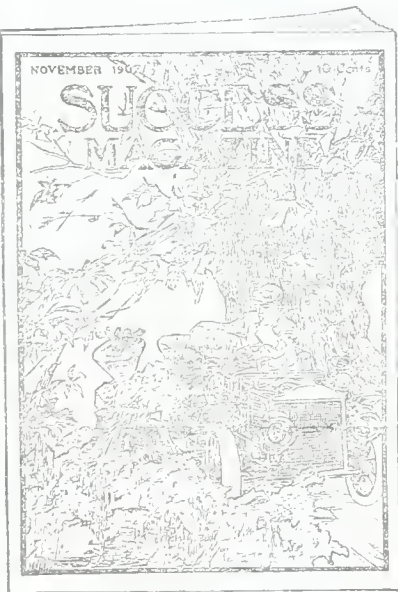
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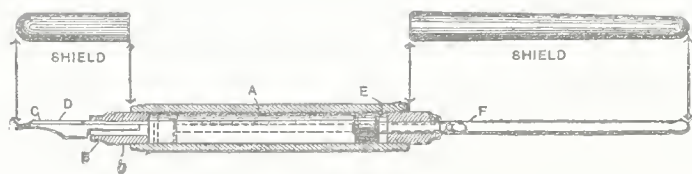


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